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Paper Industry

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OTARY UNIONS

(Trade Name)

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ype "FSG" ROTARY UNION
specially designed for con-
heavy duty service on
. This unit is flanged di-
to the journal and revolves
he drum itself.

Type "FSG" ROTARY UNION
(Flange syphon type with all graphite bearing construction)

Specialists in Steam Joints for Over 18 years!

Replace your worn out Steam Joints with ROTARY UNIONS

"Where Good Connections Count"

Low Friction

This unit employs a special heavy-duty, low-friction, metal-backed graphite bearing which requires no lubrication. This outstanding feature enables the Type "FSG" ROTARY UNION to be used for continuous service on high pressure and high temperature applications.

Syphon Support

The Type "FSG" ROTARY UNION has a two-point syphon support affording better alignment of the syphon pipe, preventing wearing-through and falling-off of syphon pipes, at the same time eliminating excessive strain on syphon pipe threads.

Guaranteed

As a result of many years of study and experimental research, together with field tests, we can guarantee the Type "FSG" ROTARY UNION to give satisfactory performance at low overall operating costs.

PERFECTING SERVICE CO., 332 Atando Ave., Charlotte, N. C.
Offices in Chicago • Cleveland • Philadelphia • Providence • Jersey City

Battery of 4-inch A.C.F. Lubricated Plug Valves controlling flow of resins and varnish at a large paint plant.

When movement of measured quantities of liquids is to be precisely controlled, A.C.F. CYLINDRICAL Lubricated Plug Valves save time. Valve open, the flow moves faster through a valve passage having at least as much area as the pipe itself. Then... a fast quarter-turn—seconds if need be—and the valve is tight-closed! Why any other valve for precise fast control!

A.C.F. CYLINDRICAL FULL PIPE AREA PLUG VALVES

Representatives in 50 Principal Cities

Ask for Catalog 4-PI, American Car and Foundry Company, Valve Division, 1501 East Ferry Ave., Detroit 11, Michigan

IMAGINE...

America without paper!

No more paper or paperboard! Not a single shipping carton or a scrap of paper for vital records and communications! Overnight, America's military effort would bog down . . . the nation's strength and security would be imperiled. Imagine the chaos on homefront and battlefront . . . without letters, orders, bulletins, plans or maps. No cartons . . . no wax or waterproof paper . . . no wrapping paper . . . no special paperboard containers to protect military supplies from rot or rust . . . *Unthinkable?* Don't take paper for granted. Anything so basic and essential should be safeguarded. America *depends* on paper! Use it wisely . . . protect its production . . . keep America strong.

America depends on

PAPER

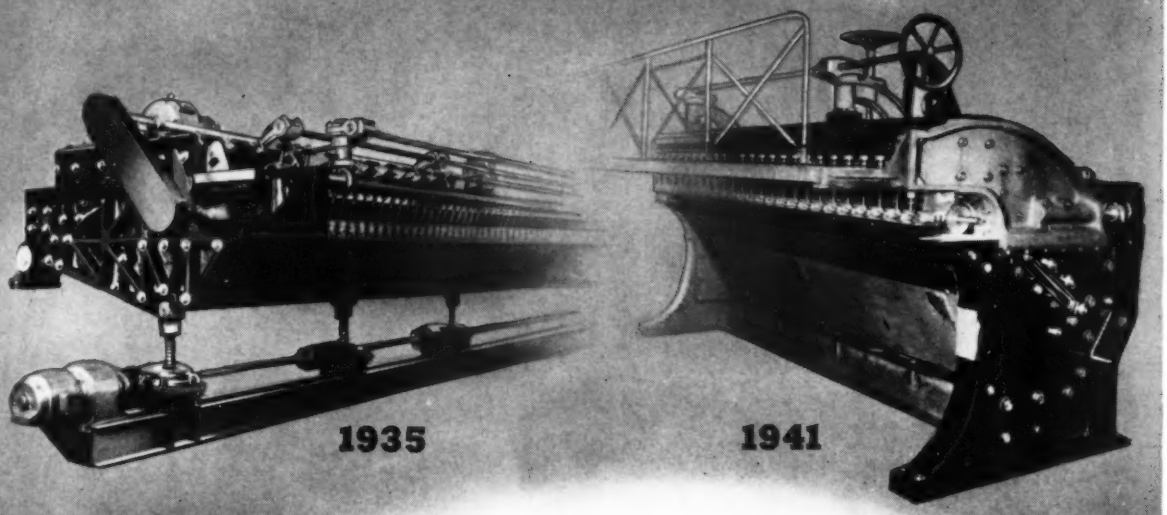
BELOIT IRON WORKS PAPER MACHINERY BELOIT, WIS. U.S.A.

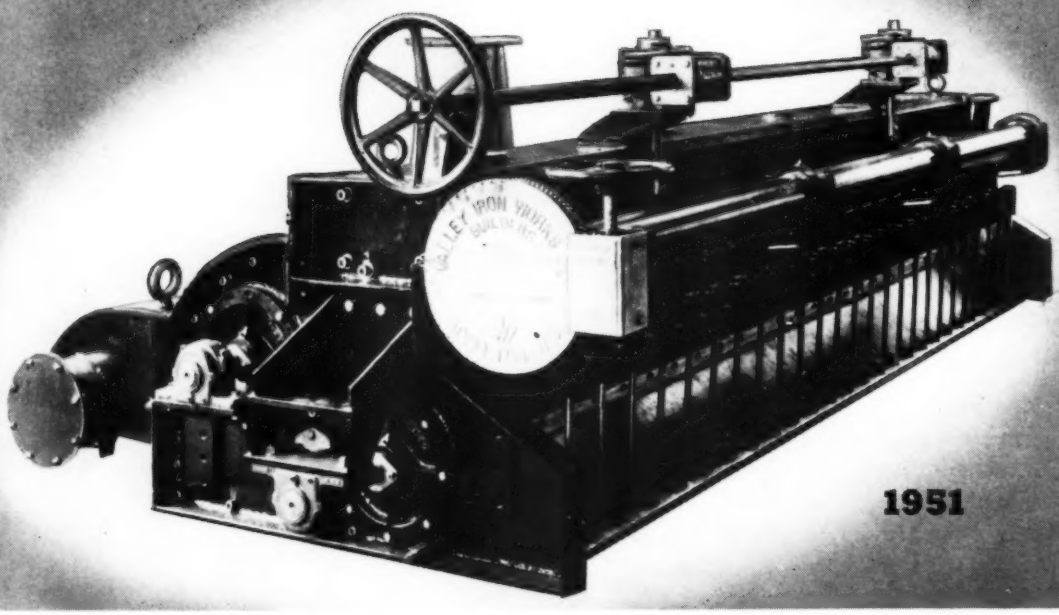
PREPARED IN THE PUBLIC INTEREST BY BELOIT IRON WORKS, BELOIT, WIS.
MAKERS OF HIGH-SPEED, HIGH-PRODUCTION PAPER MACHINERY SINCE 1858

CAN YOU USE REPRINTS? This is one of a series of messages Beloit is running in Fortune Magazine to remind the U.S. of paper's importance. Reprints for bulletin boards and mailing available. Write to Beloit Iron Works, Beloit, Wis.

PRESSURE INLETS?

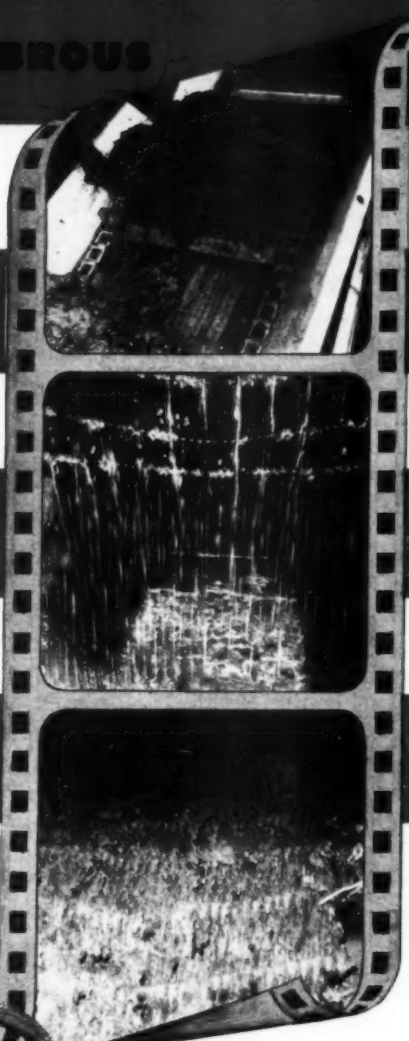
PROGRESS in inlet engineering is never-ending at Valley. This progress, over many years, has built up a reservoir of experience which is yours to profit by.





VALLEY IRON WORKS CO.
APPLETON, WISCONSIN

THE FULTON ROLL PRESS WILL SEPARATE — REDUCE — DEWATER ALMOST ANY FIBROUS MATERIAL . . .



MORE QUICKLY

◀Continuous Conveyor Feed

. . . in one CONTINUOUS operation, far faster than conventional, costly "batch" methods.

MORE THOROUGHLY

◀Reduction,

. . . thoroughly separates dust reduces fibres . . . lowers moisture content of most fibrous materials to 50% or less.

◀De-watering

MORE ECONOMICALLY

. . . Saves labor . . . power . . . handling equipment . . . water . . . chemicals . . . maintenance.

Continuous Delivery▶

Whatever your fibre-processing problem, it will pay you to investigate the FULTON Roll Press. This remarkable machine, perfected by the world's leading builder of cane mills after 99 years of experience, *will give you results never before possible with conventional equipment.*

MAY WE PROVE IT BY PROCESSING A SAMPLE OF YOUR MATERIAL WITHOUT OBLIGATION?

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MAKERS OF FINE PROCESSING AND EXTRACTION EQUIPMENT SINCE 1852

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Please send full details of FULTON ROLL PRESS
☐ We are interested in FREE test run of.....
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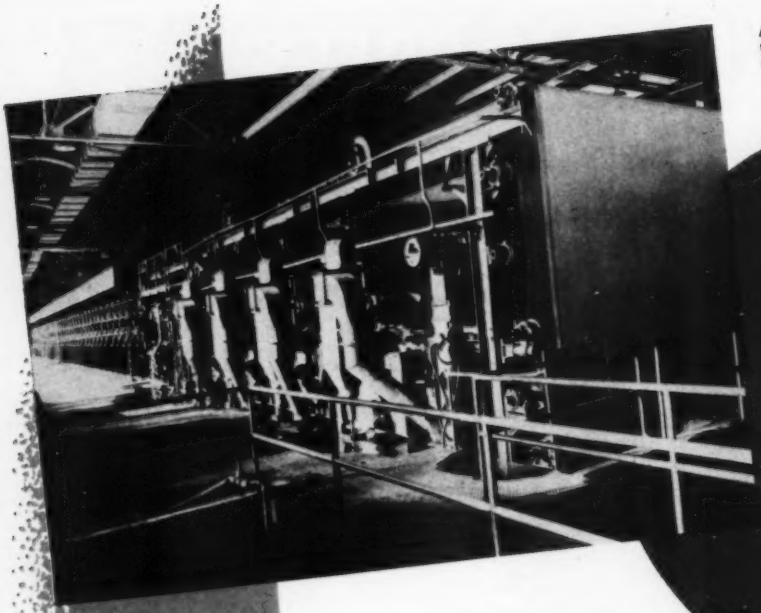

Alton's No. 3 machine, world's record strawboard producer. Photo courtesy of Alton Box Board Company, Alton, Illinois.

Nalco 3-WAY SERVICE

at Alton Box [illegible]ny

HERE are the three water treatment services performed by Nalco at Alton Box Board Company, Alton, Illinois. In addition, experimental work on process waters using Nalco anti-foam chemicals is now being done at Alton:

1 SLIME CONTROL chemicals, fitted to Alton Box Board requirements, help maintain high quality . . . prevent slime spots and breaks due to slime.

2 CLARIFICATION of mill water with Nalco #680 Sodium Aluminate . . . A versatile chemical also used widely for size control and maximum alum availability.

3 BOILER WATER TREATMENT with specially-processed organic chemicals for use in high-capacity, high-pressure boilers.

Use of Nalco Chemicals and Services at Alton Box Board Company shows clearly the wide extent to which good water treatment, properly applied, can be utilized to make over-all mill operation cleaner, more efficient and more economical.

The Nalco System can be applied selectively, or for complete water treatment protection in *your* mill. Write today for full details on your specific water treatment problems.

NATIONAL ALUMINATE CORPORATION
6232 West 66th Place
Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario

THE Nalco SYSTEM • **Serving the Paper Industry through Practical Applied Science**

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 33 • NUMBER 5 • AUGUST, 1951

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THE PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index**. An index to each volume is issued annually by the publisher as a part of the April number.

Copyright 1951 by Fritz Publications, Inc.

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

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CHICAGO 5: **John D. Henderson,** 431 South Dearborn Street, Wabash 2-3543.

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LOS ANGELES 14: **Nourse Associates,** 412 West Sixth Street, Vandike 5875 (Murray Bothwell).

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THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950, issue.

Published at 404 North Wesley Avenue, Mount Morris, Illinois.

Address all correspondence intended for publication to Editorial and Executive Office, 431 South Dearborn Street, Chicago 5, Illinois.

Member: Audit Bureau of Circulations, The Associated Business Publications.

Entered as second class matter December 13, 1948, at the post office at Mount Morris, Illinois, under the Act of March 3, 1879.

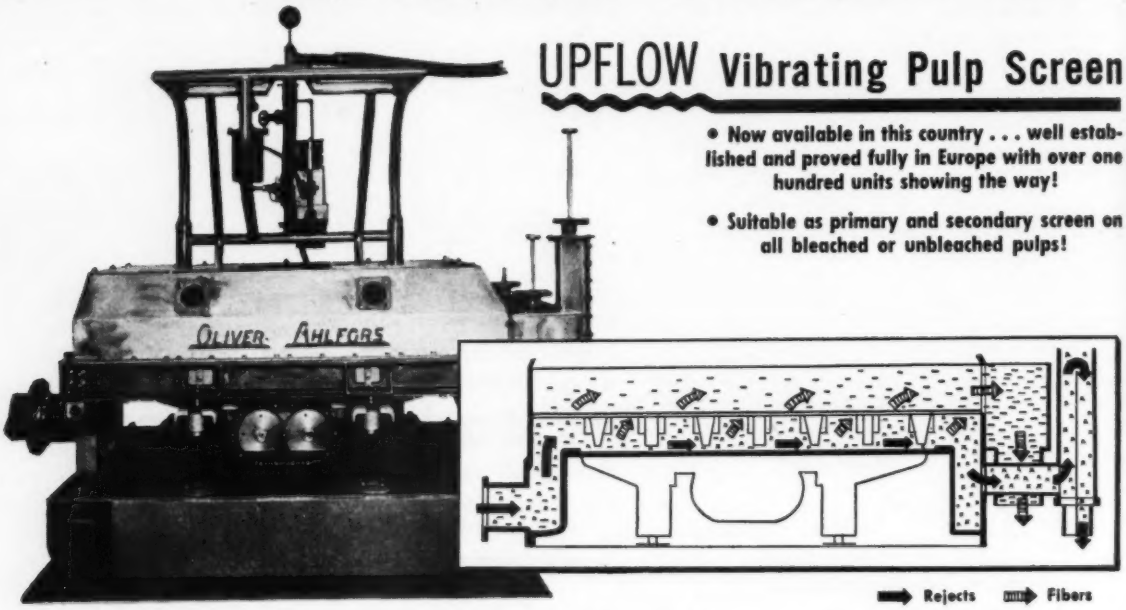
Subscription rates: United States, U. S. Possessions, and Canada, $3.00 for one year, $5.00 for two years, $6.00 for three years. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.

Announcing!

OLIVER-AHLFORS

UPFLOW Vibrating Pulp Screen

- **Now available in this country . . . well established and proved fully in Europe with over one hundred units showing the way!**
- **Suitable as primary and secondary screen on all bleached or unbleached pulps!**



THE Oliver-Ahlfors Screen operates with an upward rather than downward flow of the pulp. This unique action provides the following advantages:

1 . . . high screening capacities because slotted plate screen doesn't clog.

2 . . . knots, dirt and other rejects drop down and away from the screening surface rather than onto it.

3 . . . fast, gentle, easily adjusted vibrations.

4 . . . rejects are constantly discharged at a controllable rate.

5 . . . can operate at much higher consistencies than normal flat screens; less power required.

6 . . . smaller floor area per ton handled.

These, briefly, are a few highlights of the Oliver-Ahlfors Screen of which the upward flow of pulp and the dropping away of rejects are the outstanding features. There are other advantages—operational and structural—very much worth studying. We'll be glad to send full information on request.

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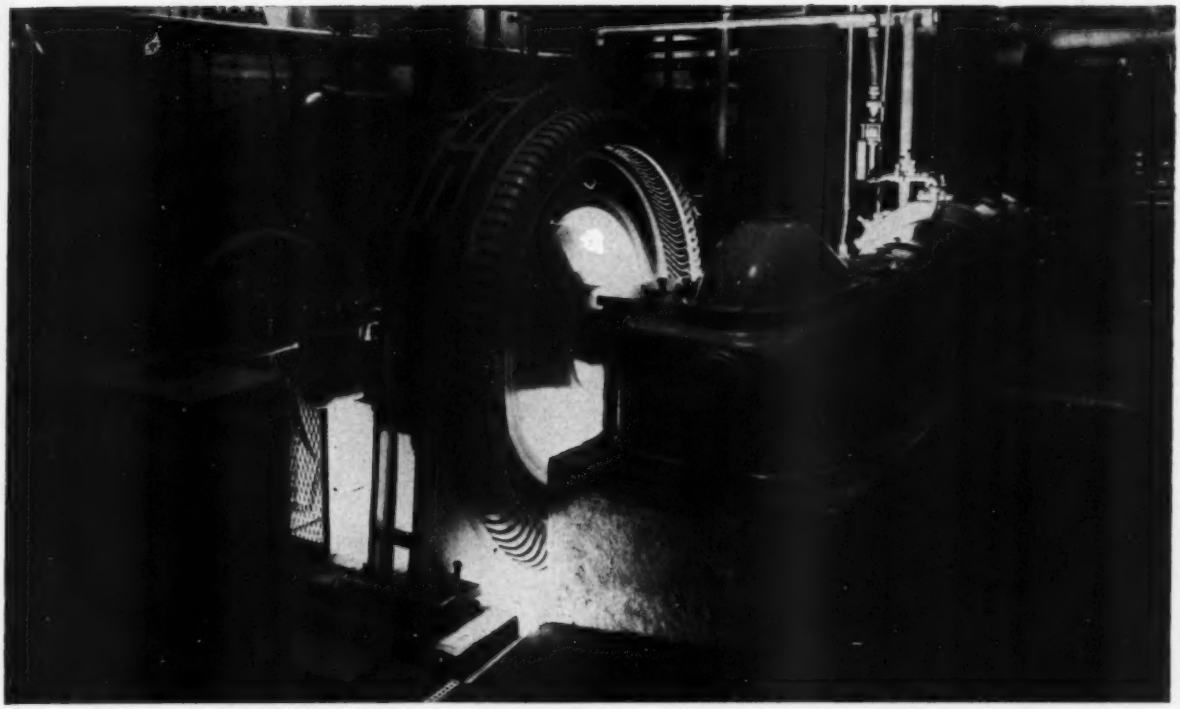

Here's the Perfect Partner for your Large Compressor

E-M

Advantages for you to remember:

1. You save money with E-M Engine-Type Synchronous Motors. No belts to buy . . . and space-saving direct mounting on the crankshaft puts installation cost at minimum. Full-voltage starting is economical. Soundly engineered, efficient design gives you lowest operating cost.

2. You're assured of long-life, trouble-free service. Frames of E-M Motors are heavy deep-section fabricated steel, reinforced and welded into a single unit. Wide rotor spokes have high torsional strength, and field poles are securely anchored with a liberal safety factor.

3. You can profit in performance and save in costs by contacting E-M early on compressor drive problems. For reliable, efficient service, E-M Engine-Type Synchronous Motors and Polarized Field Frequency Control are recognized as the *best* for any large compressor operation.

E-M Engine-Type Synchronous Motors are made-to-order for compressor drives

● Linked hand in hand for dependable production at Parke, Davis & Company in Detroit (above) are the reciprocating air compressor and its most important working partner . . . an E-M Engine-Type Synchronous Motor.

The advantages you get in economical operation, space-saving installation and low maintenance costs have made E-M Engine-Type Synchronous Motors "perfect partners" for large reciprocating compressors.

This closely matched association of compressor and motor offers you significant benefits. These direct-connected motors, having only a stator and rotor, give you unbeatable simplicity, efficiency and low cost service. The E-M Polarized Field Frequency Control insures perfect synchronizing and complete motor protection.

E-M engineers have met and solved compressor drive problems for nearly 40 years. As a result, they can design each E-M Engine-Type Synchronous Motor to match exactly specific compressor operating characteristics. Be sure to check E-M before you specify your next large compressor installation. Contact your E-M field engineer, or write the factory for E-M's 24-page booklet on Air Compressors . . . ask for Synchronizer No. 32.

ELECTRIC MACHINERY MFG. COMPANY
MINNEAPOLIS 13, MINNESOTA

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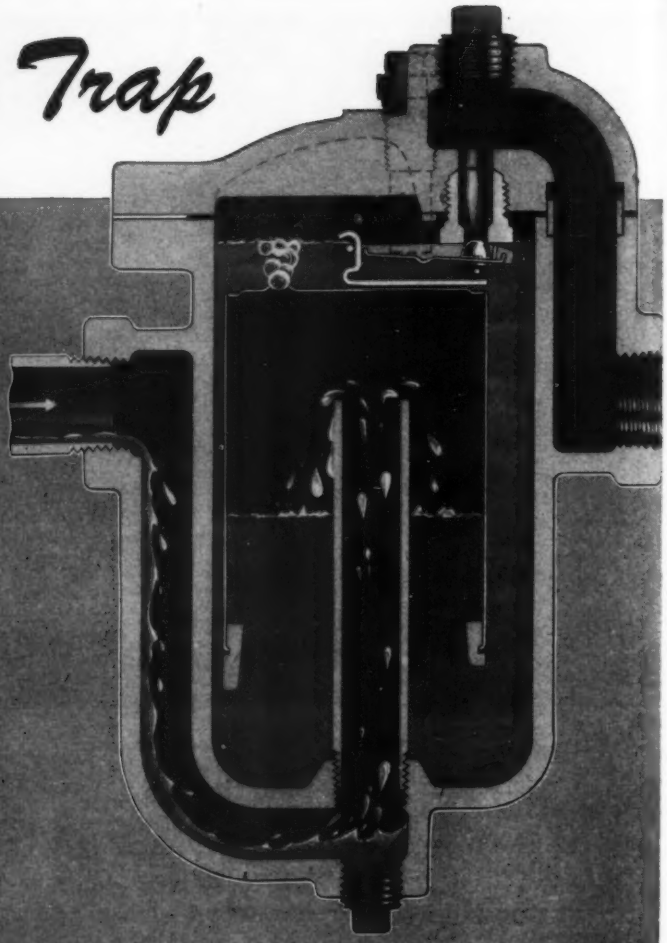
E-M SYNCHRONOUS MOTORS AND CONTROLS FOR LARGE COMPRESSOR DRIVES

This Steam Trap



MEETS THE REQUIREMENTS of Paper Machine Drainage

1. FAST VENTING OF AIR

2. LOW MAINTENANCE

STEAM traps haven't always worked so well for draining paper machines. First, they wouldn't vent air fast enough, so that heat-up was slow after the machine had been down. Second, they didn't wear too well.

The Armstrong No. 813D steam trap was designed to answer these objections. That it does has been proved by many mills with individual 813D traps on each dryer.

Large air venting capacity is secured with oversize bucket vents.

Long life with infrequent maintenance has been secured by:

1. An extended inlet tube which admits condensate, steam and air into the trap above the water level in the bucket. This eliminates excessive wear-producing agitation of the mechanism.

2. Chrome steel valve and seat — hardened, ground and lapped — same as used in traps for 900°F., 950 psig. All other working parts 18-8 stainless steel, heavily reinforced for wear.

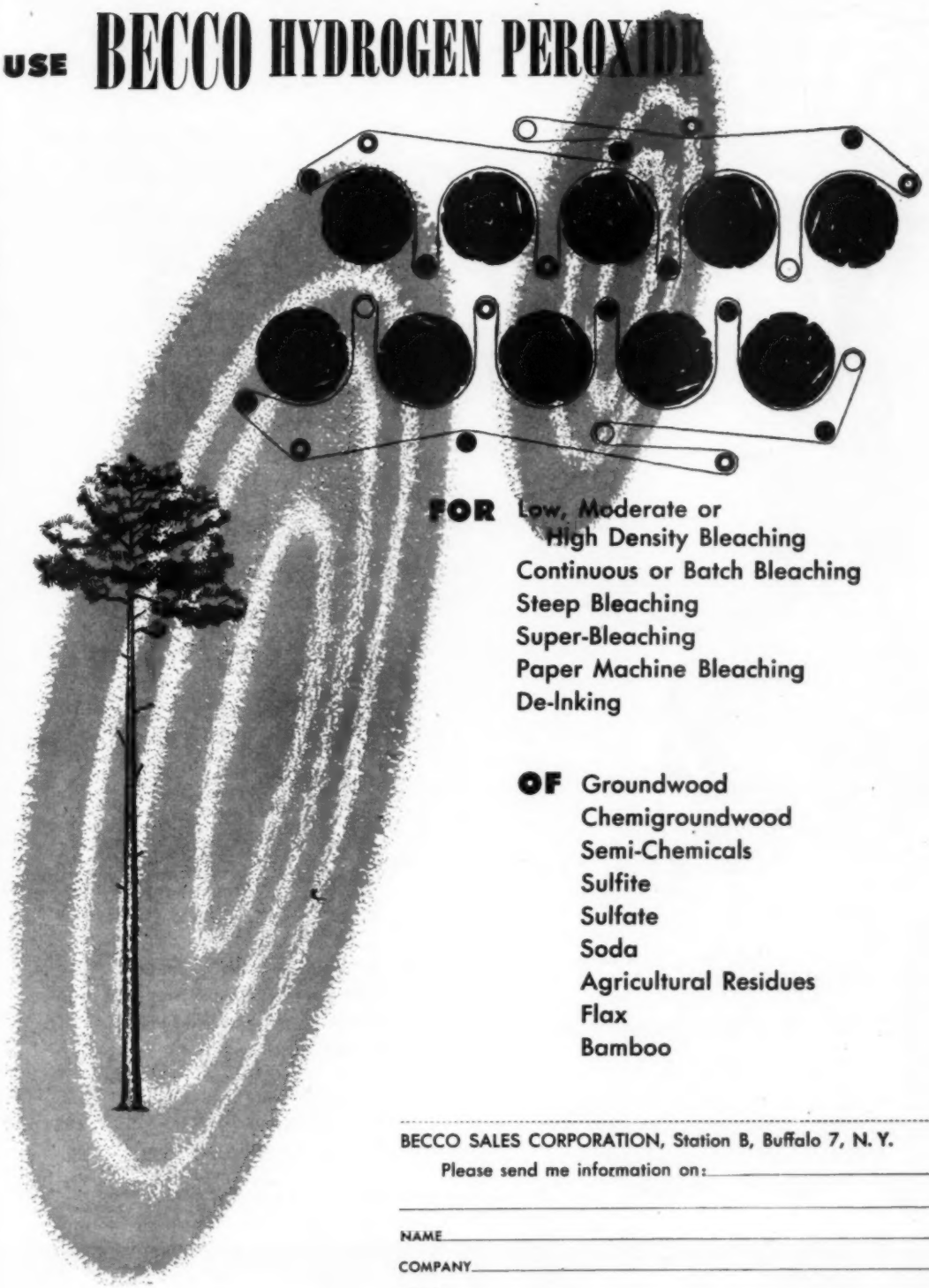
With this trap you get all the advantages of simplicity, economy, dependability and fast drainage with none of the previous disadvantages. SEND FOR BULLETIN No. 205.

ARMSTRONG MACHINE WORKS
816 Hoffman Street, Three Rivers, Michigan

ARMSTRONG

Moisture Control Systems
Individual Dryer Temperature Controls
Paper Machine Drainage Traps
Inverted Bucket Steam Traps
Steam Humidifiers

USE BECCO HYDROGEN PEROXIDE



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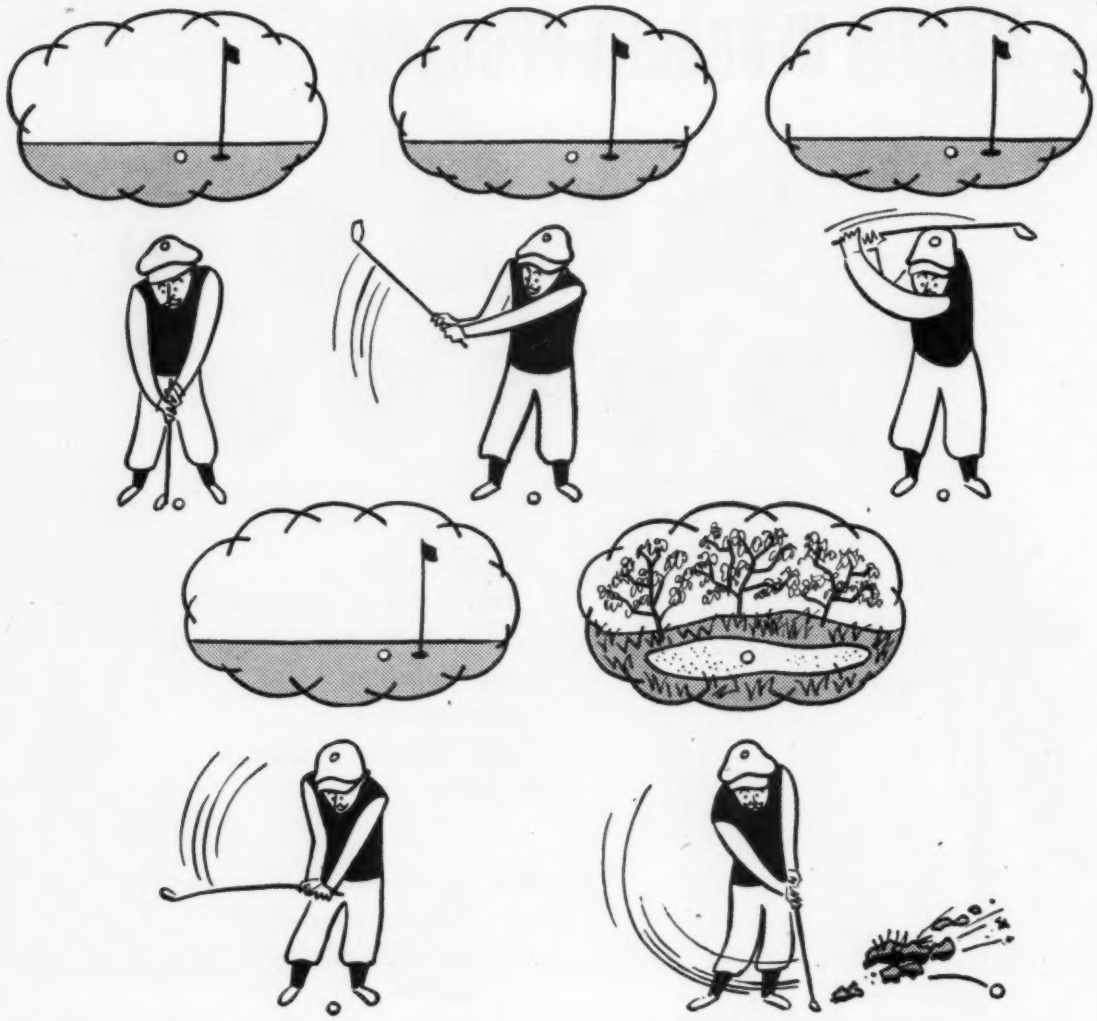

Think a stroke ahead

We got that from an old duffer we know.
He'd say, "If you want to get some place on a course
you've got to know where you want to go.
And that takes thinking ahead."

And when your production capacity hinges on
process materials like soda ash, we think it makes sense
to think ahead about a reliable source of supply.

If we can't sell you any soda ash now,
it's because we're serving our customers of record.
But we'll be glad to "think a stroke ahead" with you.
Why not get acquainted?

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA
CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE
HYDROGEN • DRY ICE • SYNTHETIC DETERGENTS • GLYCOLS
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Wyandotte, Michigan • *Offices in Principal Cities*

Wyandotte
REG. U. S. PAT. OFF.

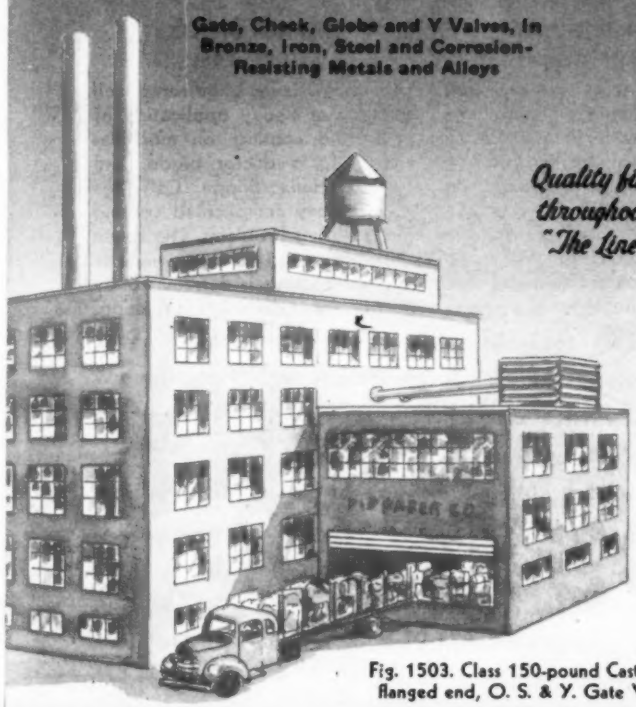
WHAT ABOUT *Wishful Thinking?*

Merely hoping a certain valve will do a required job is not enough. Maybe it will—at first. But if it's not the *right* valve in every particular—design, construction and materials—"it won't be long!"

There's a Powell Valve specially adapted to each and every flow control service. Why not always be sure with Powell?

Gate, Check, Globe and Y Valves, in Bronze, Iron, Steel and Corrosion-Resisting Metals and Alloys

Quality fine throughout "The Line"



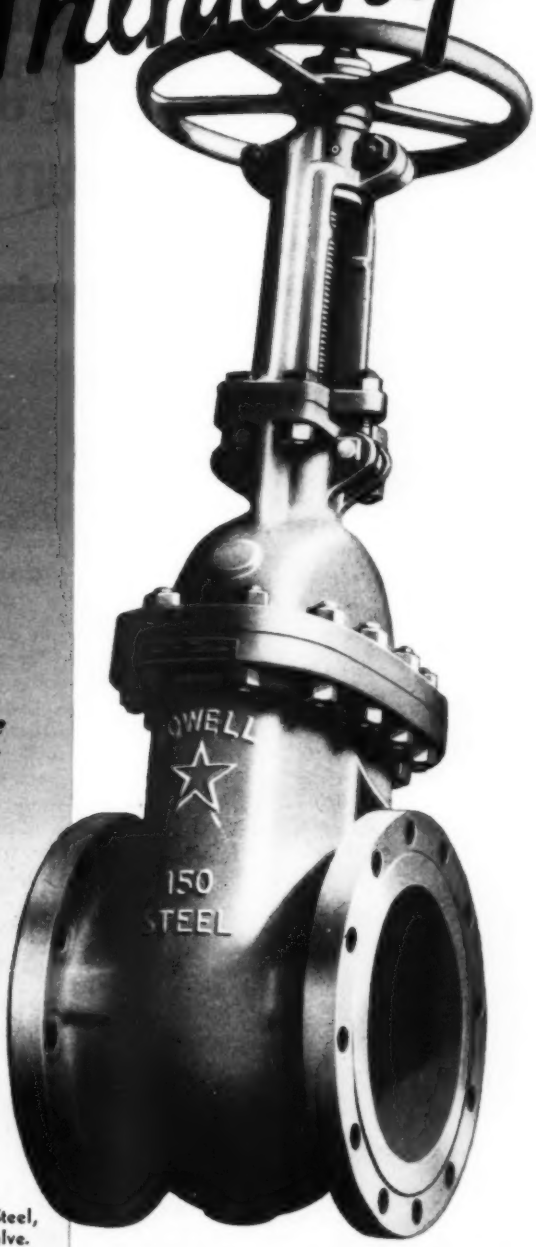


Fig. 1503. Class 150-pound Cast Steel, flanged end, O. S. & Y. Gate Valve.

POWELL

The WM. POWELL CO., 2525 Spring Grove Ave., P. O. Box 106, Station B, Cincinnati 22, Ohio

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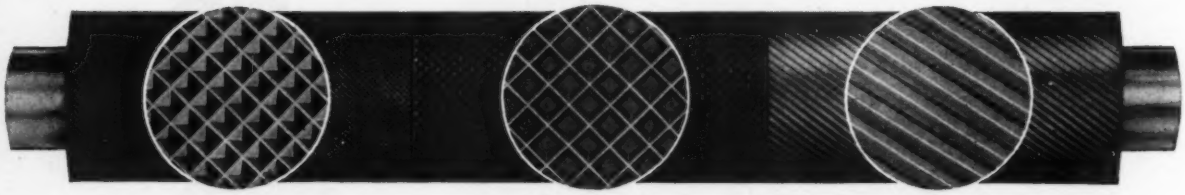
Genuine "MODERN" Precision Engraved Applicator Rolls



PYRAMID SHAPE CELL

Most generally used for light and medium application of color or coating on aniline printing machines, where the color or coating is transferred from the fountain roll to the plate or coating roll without the use of a doctor blade. Percent of dry solids in material applied determines size and depth of engraved cell.

QUADRANGULAR SHAPE CELL

Basically a gravure type cell, best suited for coloring or coating on gravure machines, or other direct application equipment using a doctor blade. The predetermined size and depth of the precision engraved cells produces uniform application. Precision engraved cells of a predetermined size and depth are available for almost any direct application.

TRIANGLE-HELIX SHAPE CELL

This scientifically engineered cell is used for heavy application of color and coating, on machines employing a doctor blade. The Triangle-Helix Shape Cell has solved many complicated coating and coloring problems. The depth of the engraved cell and weight of applied coating is determined by the percent of dry solids in solution.

ENGINEERED

By the world's largest producers of precision engraved applicator rolls, for measured application of lacquers, aniline inks, plastic and water or solvent soluble adhesive.

PIONEER PRODUCERS OF PRECISION ENGRAVED APPLICATOR ROLLS

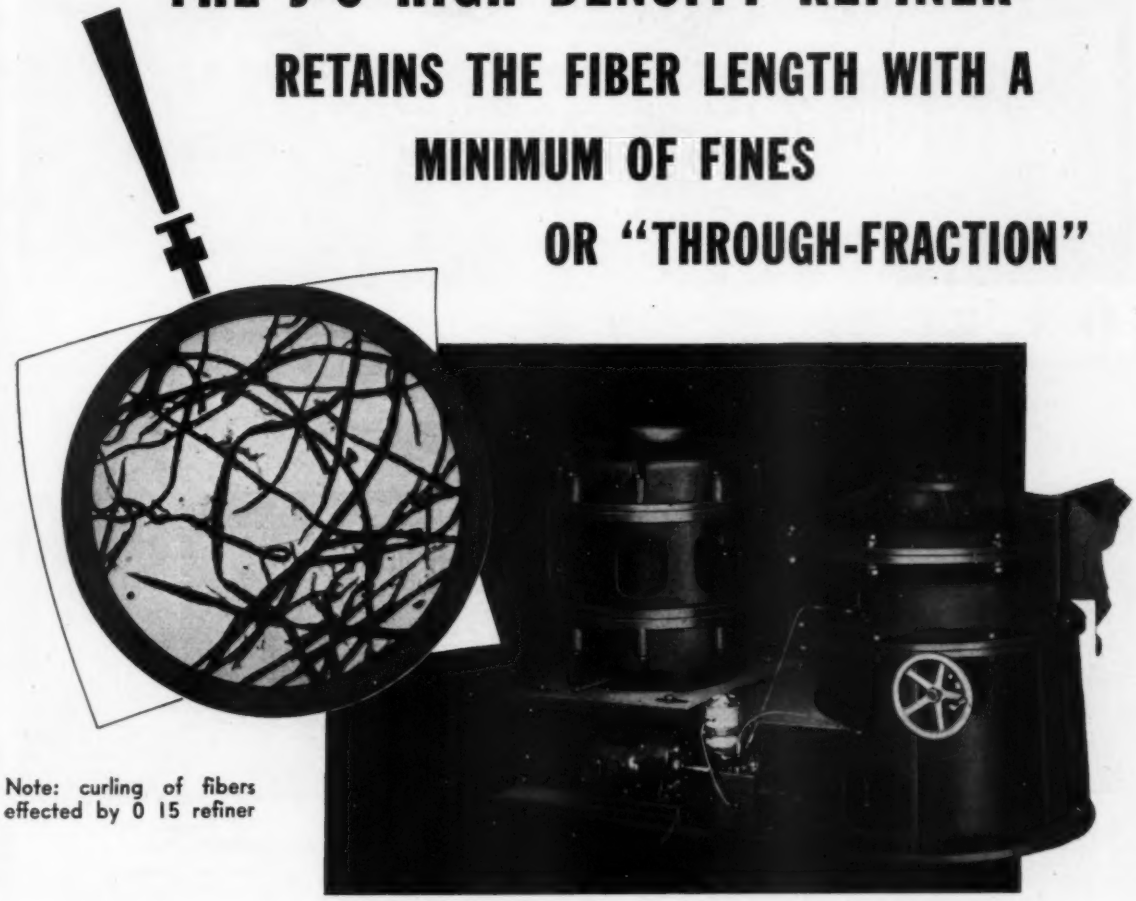
MODERN ENGRAVING & MACHINE CO.

1413 CHESTNUT AVE. HILLSIDE 5, NEW JERSEY

Copr. 1951 Modern Engraving & Machine Co.

THE J-C HIGH DENSITY REFINER

RETAINS THE FIBER LENGTH WITH A MINIMUM OF FINES OR "THROUGH-FRACTION"



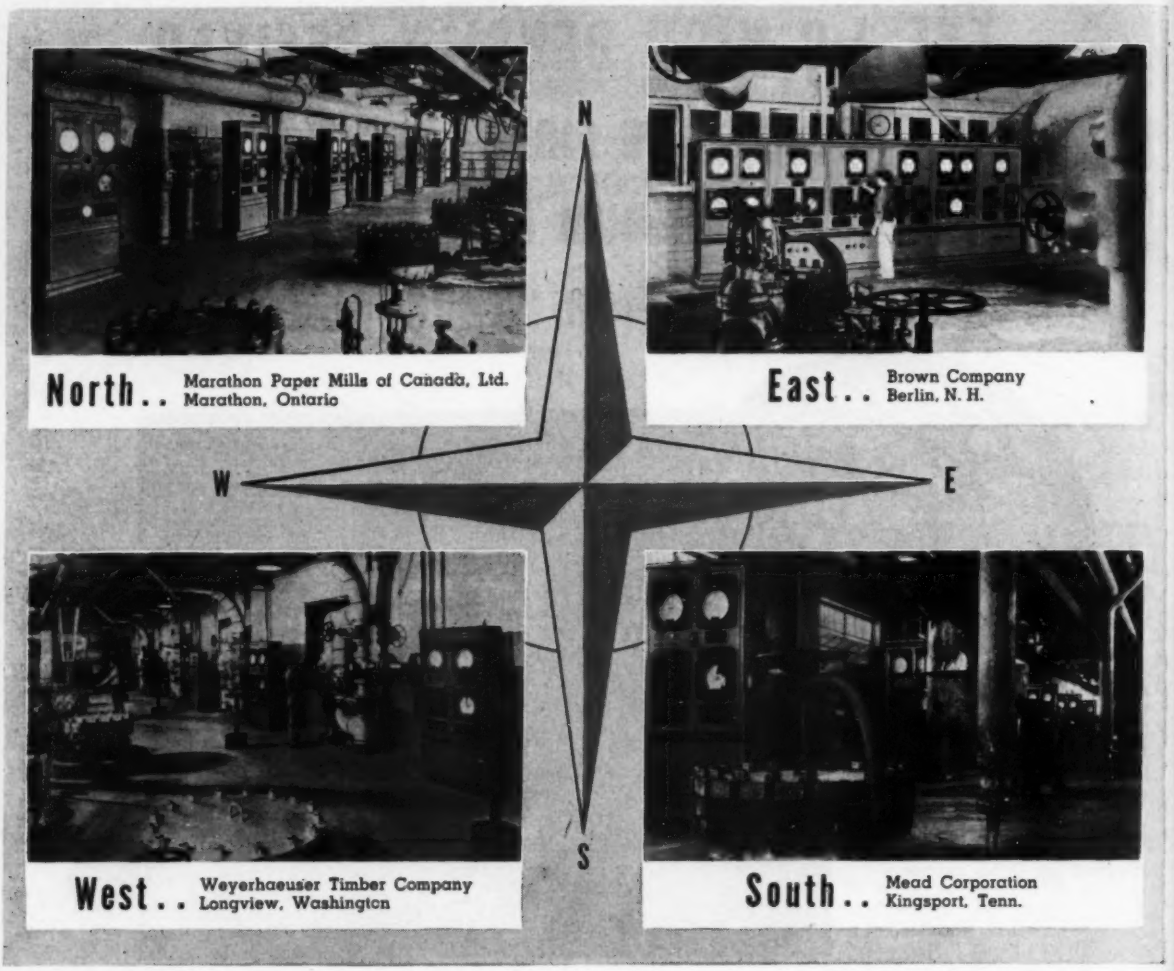
Note: curling of fibers effected by 0 15 refiner

USES: Defibering groundwood secondary screen rejects • Deshiving screened stock (groundwood)—chemical or semi-chemical • Defibering kraft and sulphite tailings • Will operate over a broad range of consistencies, but the specific power is exceptionally low at densities of 25% or higher • Self-cleaning—never plugs at any density • Has an inherently high capacity • Requires a minimum of floor space • Develops high mullen, tear and fold • Low in first cost and maintenance • Available in two sizes —with capacity of 25/50 tons/day or 75/150 tons/day • Used for introducing bleach solution uniformly into high density groundwood in the peroxide process • Develops appreciable curling as shown in photomicrograph above.

Manufacturers of the Zenith Continuous Pulp Press—Zenith Pulp Washer—High Density Refiner—Direct Heat Evaporator

J-C

A PRODUCT OF
JACKSON & CHURCH CO. • SAGINAW, MICHIGAN
WORK WELL DONE SINCE '81



Better pulp production comes automatically with FOXBORO Digester Control

Wherever pulp is made, modern digester rooms like the ones shown above are proof that Foxboro Control is the shortest route to better operation.

With this advanced-design control, you can be sure that every cook will follow the exact schedule you want. Steaming and gas-off will be held to the requirements of the individual cook. Pulp quality and uniformity will be improved, with substantial savings in steam and chemicals.

Foxboro Control Instrumentation is available for *all* types of digesters. For detailed information, discuss your problems with the Foxboro engineer in your area, or write to **The Foxboro Company, 15810 Neponset Ave., Foxboro, Mass., U.S.A.**

FOXBORO
Reg. U.S. Pat. Off.

AUTOMATIC
DIGESTER CONTROL

1951

Answer All Stuffing Box Problems . . .

JOHNSON Rotary Pressure JOINTS

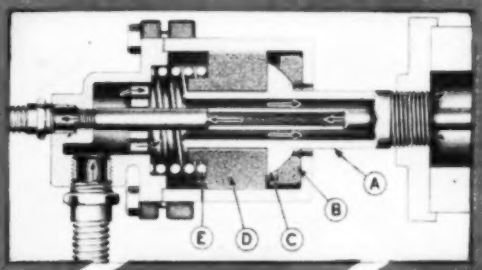
This interesting "double feature" installation shows two types of Johnson Joints on one machine. It is a good example of how the use of Johnson Joints has spread throughout the paper-making industry—for every job that involves getting heating or cooling agents in or out of calenders, drying cylinders or similar machines.

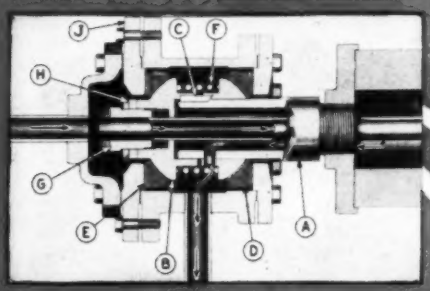
All types of Johnson Joints are completely packless, self-lubricating, self-adjusting. Compared with ordinary steam fits they can quickly pay their own way out of savings in maintenance alone. And they boost operating efficiency, stretch valuable man-hours and reduce machine shutdown in the bargain.

TYPE S JOHNSON JOINT
Completely Self-Supporting

Here is the final answer for use where considerable lateral movement of rolls is encountered. The Type S shifts with the rolls, cannot get out of alignment. Installation shows the Type S-BB, which has inlet and outlet in same vertical plane to permit head lugs for stop rods to keep joints from turning. Cross section view shows Type S-B2, which offers alternate arrangement of inlet and outlet.

Nipple (A) is connected to roll. Carbon-graphite seal ring (B) rotates against convex surface of collar (C). Guide (D) supports the joint, is also of self-lubricating carbon-graphite. Spring (E) is for initial seating only; in operation the joint is actually pressure-cooled.

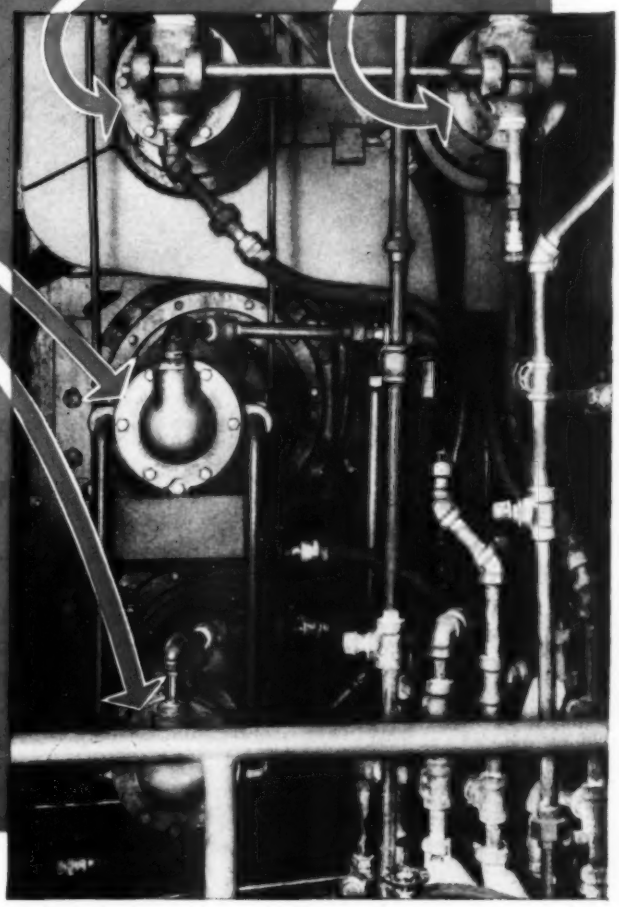




TYPE N JOHNSON JOINT
For Rotating Internal Pipe

The Type N is used where an internal distribution or removal pipe must rotate with the roll—makes the internal pipe an integral part of the joint rotating assembly. Inlet is at end of joint, outlet in side; or connections can be reversed. Installation shows Type L-NA Joint which has lugs cast on side of body for rod support; note how joints are tied together, and both suspended from above. Cross section view shows alternate horizontal inlet or outlet.

Nipple (A) is connected to roll. Sliding collar (B) is keyed to nipple at (C), but fits loosely so pressure can fill housing and press carbon-graphite seal rings (D) and (E) against collars. Spring (F) is for initial seating only. Note packing gland (G), with lock nut (H), which permits longitudinal movement of internal pipe. Assembly plate (J) permits removal of head and internal pipe without dismantling joint.



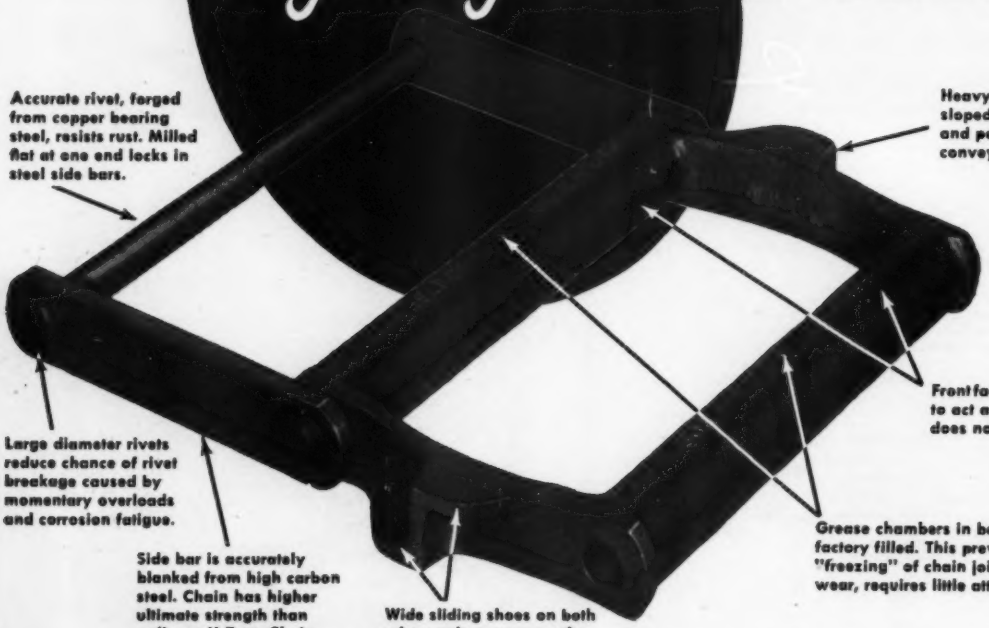
Many machinery manufacturers furnish Johnson Joints as standard equipment. Write us today for all the facts.

Products of The Johnson Corporation

845 Wood St., Three Rivers, Michigan

Rotary Pressure Joints • Compressed Air Separators and Aftercoolers
Direct Operated Solenoid Valves • "Instant" Steam Water Heaters

it's stronger.. it lasts longer... it gives you better service!


Accurate rivet, forged from copper bearing steel, resists rust. Milled flat at one end locks in steel side bars.
Heavy wearing shoes are sloped to avoid catching and possible damage to conveyor.
Front faces of barrels designed to act as scrapers. Material does not pack in the trough.
Large diameter rivets reduce chance of rivet breakage caused by momentary overloads and corrosion fatigue.
Grease chambers in barrels are factory filled. This prevents "freezing" of chain joints, reduces wear, requires little attention.
Side bar is accurately blanked from high carbon steel. Chain has higher ultimate strength than ordinary H-Type Chain.
Wide sliding shoes on both edges reduce wear on the chain and trough.

NEW REX* COMBINATION-TYPE REFUSE CHAIN HAS OUTSTANDING ADVANTAGES

Here's the finest chain for conveying sawdust, refuse, wood chips and similar material.

Rex *Combination-Type* Mill Chain is designed to handle assignments that prove too tough for ordinary H-Type Chain.

Check the captions. Each one points out an important reason why this new chain will give you longer service . . . better service . . . and lower overall costs. What's more, it can easily replace corresponding H-Type Chain, since it operates efficiently over the same sprockets and in the same trough.

For all the facts on this new chain, write to Chain Belt Company, 1714 W. Bruce Street, Milwaukee 4, Wisconsin.

OTHER REX FAVORITES IN THE PULP AND PAPER MILLS

Rex H-Type Chain

Rex Steel Chabelco* Chain

Rex Log Haul Chain

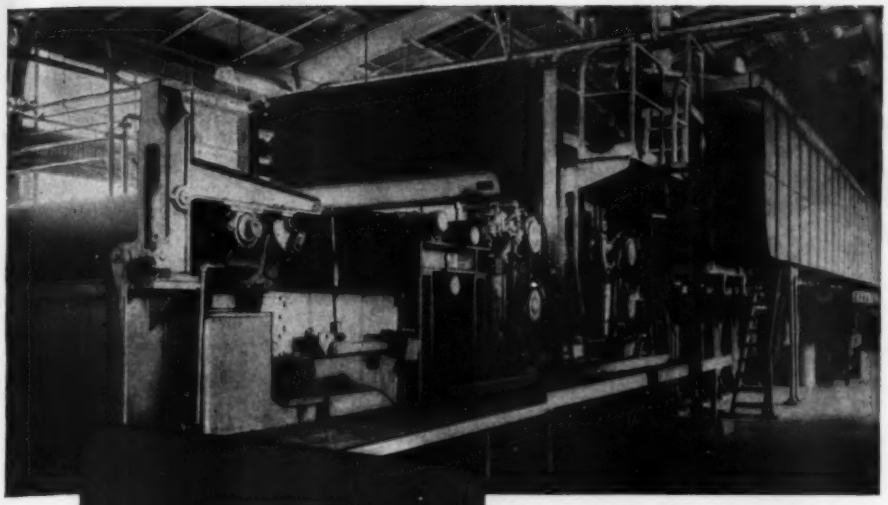
Rex Durobar* Combination Chain

Baldwin-Rex* Roller Chain

*T.M.Reg.U.S.Pat.Off.

CHAIN BELT REX COMPANY ®

PULP MILL CHAINS



DOWNINGTOWN FELT MACHINE at The RUBEROID Co. mill, Mobile, Alabama

New Downingtown Felt Machine from wet end consisting of a cross-flow mix box (not shown) and Conflow vat illustrated in the foreground, a press section with two plain presses and stands for the future addition of a suction primary press. In the background is a two deck dryer section with forty-two 4'0" diameter dryer rolls.

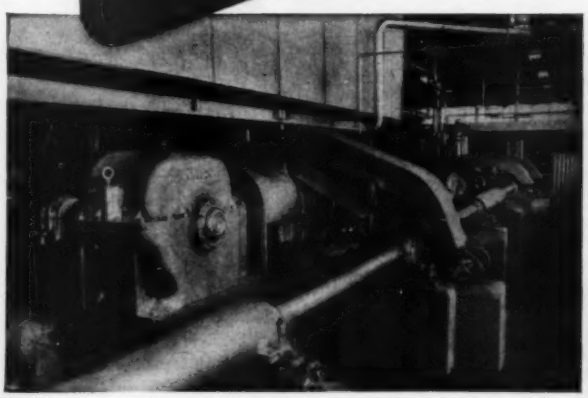
30% per day OVER designed production rate

Here is a *completely* new, integrated roofing felt mill recently built by The RUBEROID Co. From 1948 until its completion, Downingtown and Ruberoid engineers collaborated in the development of this mill which, because of certain limiting factors, presented problems of design and arrangement not usually encountered. That these problems were successfully overcome, plus the fact that production reached over 30% *above* design capacity is an achievement in which Downingtown is proud to have played a part.

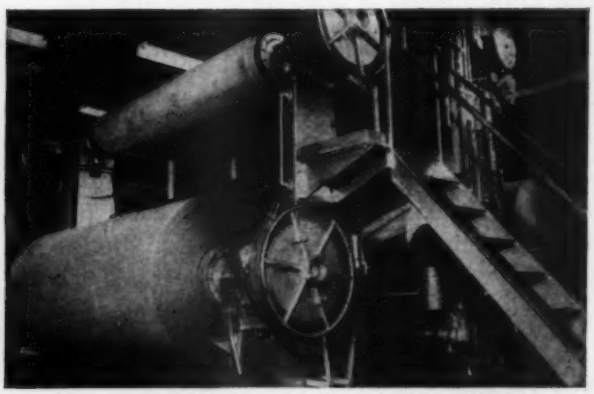
Write for further information about this unusual felt mill.

DOWNINGTOWN MANUFACTURING CO., DOWNINGTOWN, PA.

Pacific Coast Representative: John V. Roslund, Pacific Bldg., Portland 4, Oregon



Line shaft and sectional drives with Downingtown spiral bevel gear units and vari-pitch sheaves.



Reel capable of making 72" diameter rolls on the Winder.

DOWNINGTOWN

DESIGNERS AND BUILDERS OF PAPER, BOARD AND FELT MACHINES SINCE 1888

The Rice Barton DynoPulper

a high production machine

...ideal for disintegrating pulp, broke or waste papers

Other DynoMachines:

- The **QuatroPulper** is designed for processing stock in large capacities . . . either batch or continuous operation.
- The **DynoChest** is primarily for disintegrating stock in slush form . . . batch operation.
- The **DynoFiner** is for performing the same operation on a continuous basis.

The DynoPulper is also designed for continuously discharging the finished pulp

THE stock is charged all at one time into the top of the vat. Two DynoPellers (described below) subject it to the vigorous dynomizing action that completely separates each fiber from its neighbor without cutting or shortening and with a small drop in freeness. The simple operating principle and design of the DynoPulper eliminates the "wracking" and grief of other types of pulpers. Because there are few moving parts there is no loss of production time due to repair or adjustment. The DynoPulper defibers the stock at low cost and produces a high quality slurry quickly and effectively.

RBR-9

The DynoPeller

is the heart of all DynoMachines. Its concave face is lined with rough, hard carbide particles. As the DynoPeller rotates it causes a suction at its center that pulls the stock towards it. Centrifugal force then causes the stock to flow rapidly over the rough carbide particles under a gentle hydraulic pressure. This effective dynomizing action completely disintegrates the stock . . . separating each fiber from its neighbor while maintaining its original length.

RICE BARTON Research Corporation

WORCESTER 1, MASS.

Answer to your emergency needs: two steels that will do 90% of your hollow parts jobs!

1. 52100 TUBING

101 stock sizes. A high carbon chrome, direct quenching steel which gives through hardness in moderate sections. Typical uses: aircraft parts, slitter knives, bearing races, pump parts and plungers, collets, bushings, spindles, grinding machines, precision instruments.

2. "NICKEL-MOLY" TUBING

52 stock sizes. A low carbon nickel moly, carburizing steel which gives high surface hardness with a tough core. Typical uses: piston pins, bearing races, farm equipment, knitting machinery, sleeves, bushings, pump parts, perforating guns.

NEED steel for a rush job? Two general purpose Timken® steels—52100 tubing and "Nickel-moly" tubing—will do 9 out of 10 of your hollow parts jobs. And you can get immediate delivery on warehouse lots.

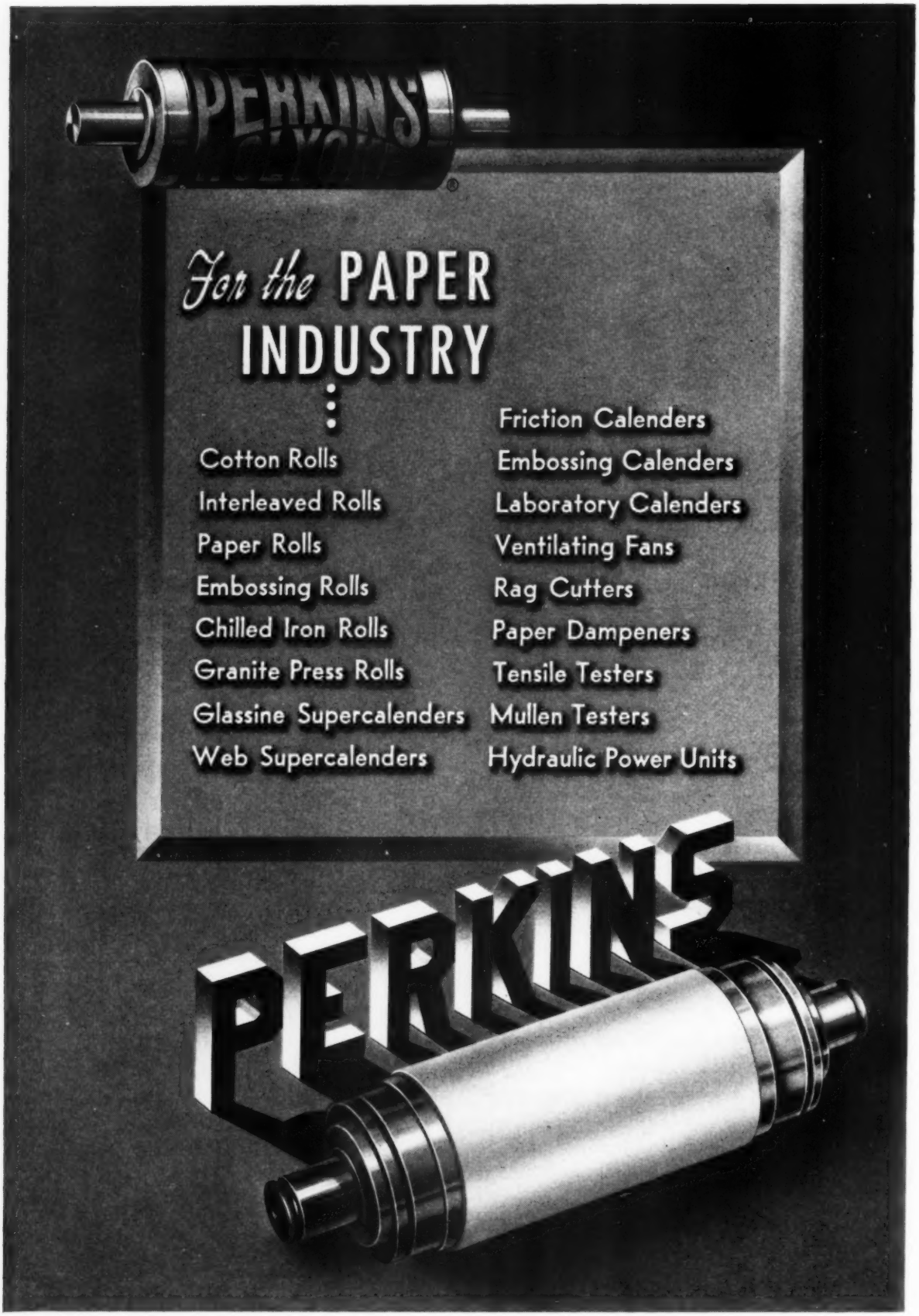
We maintain a mill stock of 101 sizes of 52100 tubing (from 1″ to 10½″ O.D.) and 52 sizes of "Nickel-moly" tubing (from 1⅜″ to 10¼″ O.D.). Both steels have excellent hardenability and extreme wear resistance.

You can be sure of getting the properties you want in every tube of every heat. We melt the steel, roll the billets and pierce the tubes, all in our own mill under the most rigid quality control.

For a stock list giving heat treating instructions as well as available sizes and finishes, write on your company letterhead to The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.


PERKINS
For the PAPER INDUSTRY
Cotton Rolls
Interleaved Rolls
Paper Rolls
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Embossing Calenders
Laboratory Calenders
Ventilating Fans
Rag Cutters
Paper Dampeners
Tensile Testers
Mullen Testers
Hydraulic Power Units
PERKINS

Paper coated with ALATHON*
Polythene Resin

stops moisture vapor

A coating of Du Pont "Alathon" polythene resin on paper makes a moisture-resistant packaging material. Some products must be kept dry . . . some moist. Since "Alathon" does either job equally well, it is an ideal material for packaging such hygroscopic materials as fertilizer and calcium chloride, and moist products such as peat moss and meat trimmings.

"ALATHON" IS SCUFF-RESISTANT

Thin coatings of "Alathon" on kraft, glassine and other papers are exceptionally durable and have good scuff resistance. Moreover, it is economical to use "Alathon" for many coating purposes. Because of its low specific gravity (0.92), one pound of "Alathon" will cover 30,000 square inches of paper with a 1-mil coat.

*REG. U. S. PAT. OFF.

DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

Polychemicals
DEPARTMENT
CHEMICALS • PLASTICS

"ALATHON" IS CHEMICALLY INERT

Package paper coated with "Alathon" gives long-lasting protection against attack by many chemicals. The resin itself is odorless, tasteless and non-toxic. Properties like these make paper coated with "Alathon" an ideal packaging material for foods of many kinds.

"ALATHON" CAN BUILD FUTURE SALES

Because of its outstanding chemical and physical properties, manufacturers and processors of many kinds of industrial and consumer goods will want paper coated with "Alathon" for their packaging material. Plan *now* to profit with "Alathon."

Present demand exceeds our production. But by planning now, you'll be able to move fast when "Alathon" is available. Write for more information about Du Pont "Alathon" polythene resin . . . or for technical assistance. We'll be glad to help you.

E. I. du Pont de Nemours & Co. (Inc.)
Wilmington 98, Delaware

Meet them HALF WAY

Selection of the proper felts for a paper or board machine generally requires a compromise between quantity of tonnage and quality of finish.

Right now your customer may be calling for more tonnage with only incidental consideration for finish.

The representative of the manufacturers will recommend Hamilton Felts that assure a happy compromise —plenty of tonnage with better finish than you expect.

From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, cheaper and faster.

Hamilton Felts

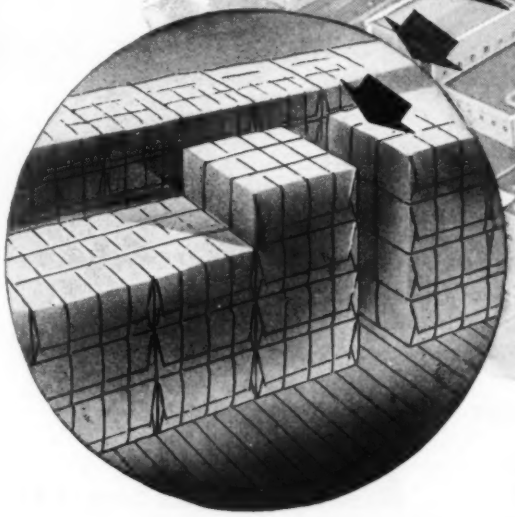
MIAMI WOOLEN MILLS

Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO

"Packaged Mills"

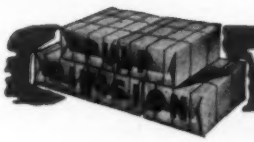
mean more woodpulp



Close integration of the various wood-processing plants at a Weyerhaeuser Timber Company mill and full diversified manufacturing are very much evident in the company's pulp manufacturing centers. Improved technology at the mill site, with greater accent on better utilization of what was previously considered waste material, is a real answer to a permanent forest industry.

Weyerhaeuser's sulphate mill at Longview, Washington, is a step forward in whole crop utilization. In this manufacturing center, sawmill left-overs and logs not suited for lumber are converted into sulphate pulp. The Kraft pulp mill utilizes Douglas fir slabs, edgings and trimmings from the sawmills and Douglas fir peeler cores from the plywood plant. Many technological advances make this process economically sound. Not the least of these is a hydraulic barker for saw logs, which means that bark-free milling left-overs now can go directly to the chipper without further handling.

"Packaged Mills", supplied by well managed "Tree Farms", will provide the Pulp Division, Weyerhaeuser Timber Company with more and more woodpulp in the years to come.



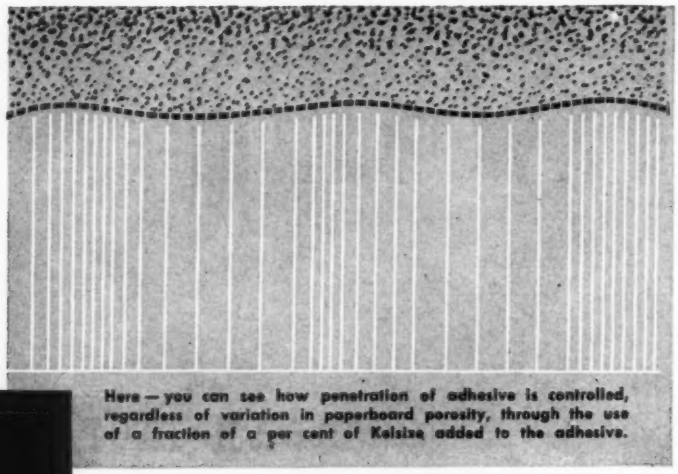
WEYERHAEUSER

for UNIFORM PENETRATION

of adhesive in corrugated paperboard

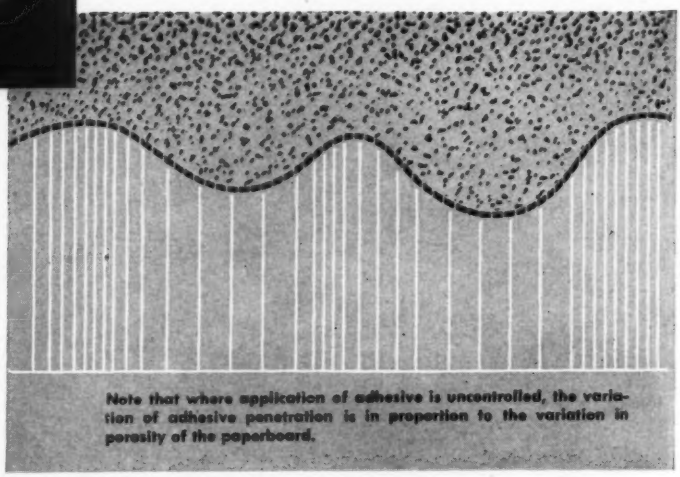
...USE

Kelsize



Here — you can see how penetration of adhesive is controlled, regardless of variation in paperboard porosity, through the use of a fraction of a per cent of Kelsize added to the adhesive.

Here are representative cross sections of a sheet of paperboard showing variation of both internal and surface porosity.



Note that where application of adhesive is uncontrolled, the variation of adhesive penetration is in proportion to the variation in porosity of the paperboard.

KELSIZE... gives these advantages

- Less adhesive used . . . less moisture to remove
- Reduced warping . . . stiffer board
- Higher machine speeds
- Adhesive where you want it . . . where it's needed

Our Technical Service Department will gladly give you more detailed information. Write or call our nearest regional office.

KELSIZE

. . . A PRODUCT OF

KELCO — REFINED ALGIN PRODUCTS

KELCO COMPANY

20 N. Wacker Drive
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10 TONS OF PULP PER BLOW

Profitable production of high grade kraft, wrapping and bag, is evident at the Southern Division mill of the Hudson Pulp and Paper Corporation near Palatka, Florida. Operations began in 1947 and proved so successful that within three years new additions, designed to double the former output, were added.

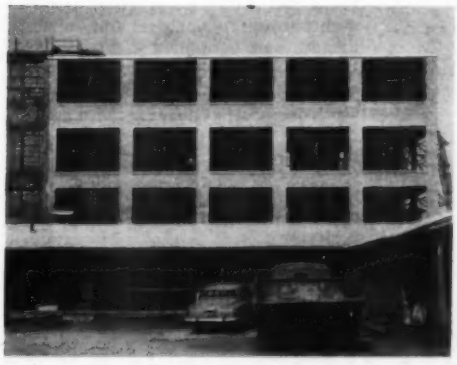
Horton welded steel digesters have been serving the mill since it began operation. Originally four Horton digesters each having a capacity of 3320 cubic feet or 10 tons of pulp per blow were installed—and five more have been put into service with the recent expansion. Together these nine Horton digesters help keep production at a high level for the Hudson Pulp and Paper Corporation.

For more information about Horton digesters or other steel structures—and their application in the pulp and paper industry—write our nearest office. There is no obligation on your part.

Left: Looking up at one of the original Horton digesters installed at the Southern Division Mill of the Hudson Pulp and Paper Corporation. Below: Extension to digester building housing five Horton digesters at Hudson plant near Palatka, Florida.

Horton Equipment for the Pulp and Paper Industry

chip tanks . . . blow tanks . . . pulp tanks
elevated water tanks . . . Marx Savealls
sulphate and sulphite digesters . . .
accumulators . . . acid tanks . . .



CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3.....2143 Healey Building
Birmingham, 1.....1511 North 50th Street
Boston, 10.....1026—201 Devonshire Street
Chicago, 4.....2445 McCormick Building
Cleveland, 15.....2267 Guildhall Building
Detroit, 26.....1566 Lafayette Building
Houston, 2.....2143 National Standard Building
Los Angeles, 17.....1559 General Petroleum Building
New York, 6.....3350—165 Broadway Building
Philadelphia, 3.....1653—1700 Walnut Street Building
Salt Lake City, 4.....527 West 17th South Street
San Francisco, 4.....1547—200 Bush Street
Seattle, 1.....1327 Henry Building
Tulsa, 3.....1651 Hunt Building
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Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.

Control CALIPER and WEIGHT AUTOMATICALLY

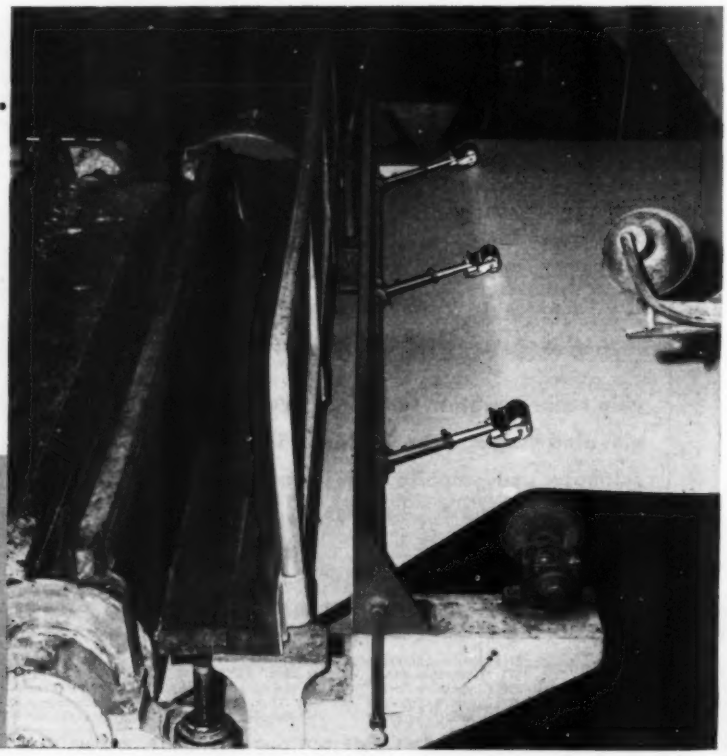
CUT COSTS • IMPROVE QUALITY • SAVE TIME • INCREASE TONNAGE

The Hurletron Automatic Caliper and Basis Weight Control will maintain density of plus or minus 3% on board within a complete range of 5 to 100 points at the dry end.

Think what that means . . . more uniform caliper . . . more uniform basis weight throughout the run . . . increased hourly production . . . a reduction in man and machine hours . . . a definite saving in stock tonnage through elimination of excess density . . . increased production through prevention of broke . . . and a more salable product due to improved quality. The Hurletron unit accomplishes all this through a unique system of controls which are automatic, positive and continuous.

- It automatically measures thickness at 40″ intervals *clear across the sheet.*
- It automatically provides a continuous, permanent record of wet end caliper variations.
- It automatically makes corrections, when required, by increasing or decreasing flow from the stock flow regulator.
- It recognizes momentary oscillations and transitory signals, but corrects *only* when a *definite trend* has been established in the sheet.
- It automatically signals the operator when a drift across the sheet is indicated.
- It provides a continuous reading and record of caliper at the dry end giving a complete history of every foot of paper or board in the roll.

The Hurletron Automatic Caliper and Basis Weight Control is precision engineered and ruggedly built to withstand the punishment of round-the-clock service. Its unique advantages have been thoroughly proved by long service in a number of the country's leading mills.



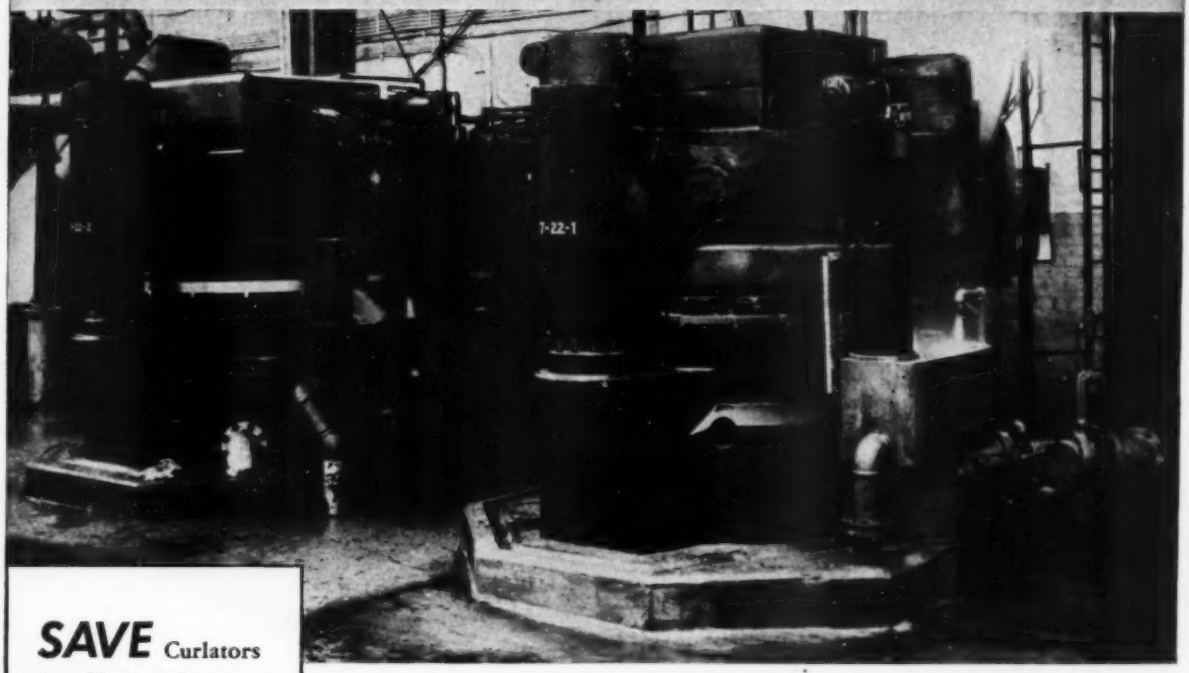
WRITE FOR OUR NEW BULLETIN

Complete details about the Hurletron Control together with photographs, charts and diagrams are contained in our Bulletin No. 211. Write for your copy today. There's no obligation.

ELECTRIC EYE EQUIPMENT COMPANY
10 WEST FAIRCHILD STREET
DANVILLE, ILLINOIS

HURLETRON
Automatic
CALIPER and WEIGHT CONTROL

CURLATION CAN SOLVE THESE PROBLEMS!

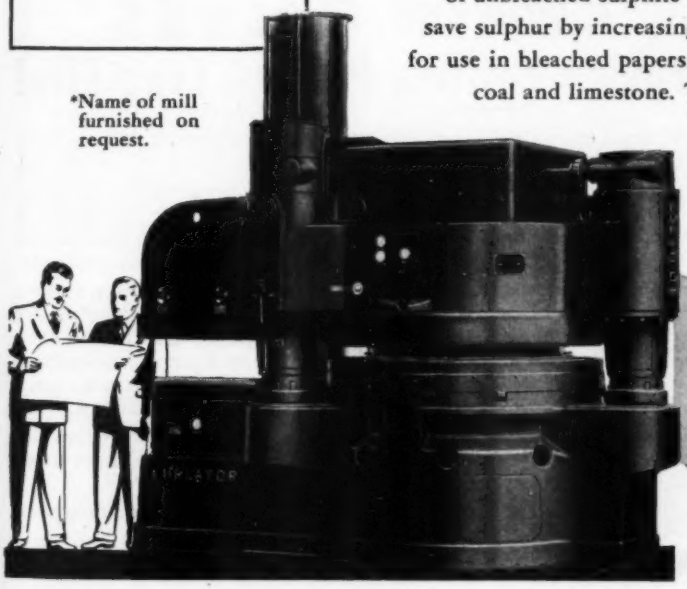


SAVE Curlators in mill operations are making substantial savings in sulphur, pulpwood, coal, and limestone.

These CURLATORS are saving this mill* more than 10% of sulphur, pulpwood, coal and limestone.

By *Curlation* you too may save 10% of your sulphur in the manufacture of unbleached sulphite for use in unbleached papers. You can also save sulphur by increasing the net yield, of unbleached sulphite pulp for use in bleached papers. In addition *Curlation* will save pulpwood, coal and limestone. These savings will not only lower costs but help conserve scarce materials.

*Name of mill furnished on request.



WRITE today and find out for yourself, without obligation, what a Curlator can do for you.

CURLATOR† *Corporation*

565 BLOSSOM ROAD · ROCHESTER 10, NEW YORK

†T. M. Reg.—Curlator Corporation, Rochester, N. Y.

Simple Drive or Complex Transmission

WHITNEY
CHAIN DRIVES
Provide Positive Power—Long Life!

Whitney Chain Drives provide innumerable opportunities to save time and money by simplifying drive design.

If your power transmission problems involve long or short centers, reversal of direction, timing motions, fractional or hundreds of horsepower, the unusual adaptability of Whitney Chain Drives will help you meet your design requirements efficiently and economically.

Besides meeting your designs, Whitney Chain Drives help to make a good product better. Their positive grip assures efficient power transmission . . . means that you get *full rated Horsepower* from driver to driven elements. They reduce costly down time — are easy to install, easy to remove without disconnecting shafts or bearings. Their rugged construction of hardened alloy steel parts assures long service with minimum maintenance . . . a vital point in these days of all-out production.

From the complete line of Roller, Silent and Conveyor Chain Drives, Whitney engineers can recommend, without bias, the proper type of drive for each application . . . the chain drive which will give you the best service at lowest cost.

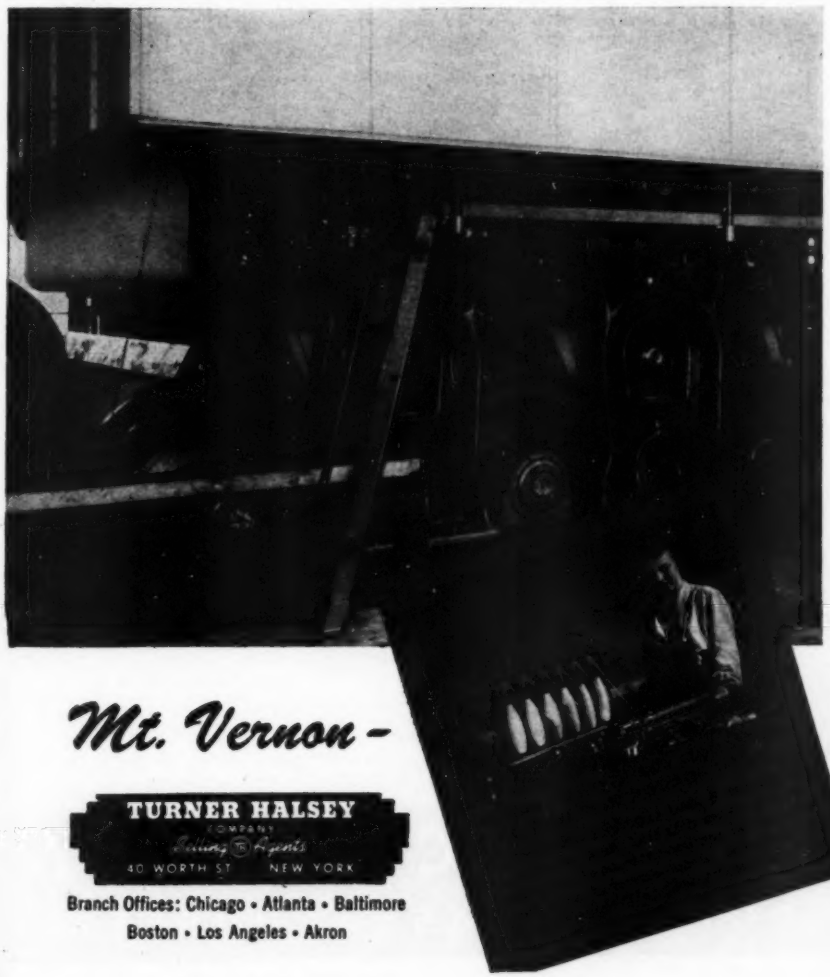
Consult your local Whitney Field Office or Distributor, or write direct to us for complete information and catalog.

WHITNEY CHAIN COMPANY 236 HAMILTON STREET, HARTFORD 7, CONNECTICUT

SCIENTIFIC CONSTRUCTION

DRYER FELTS

Gives You Scientific Construction



Asbestos yarns woven at scientifically determined intervals into the face of Woodberry 887 heavy duty dryer felts means longer wear, lower steam consumption, increased porosity, finer paper quality.

AT YOUR SERVICE

Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.

Mt. Vernon – Woodberry Mills

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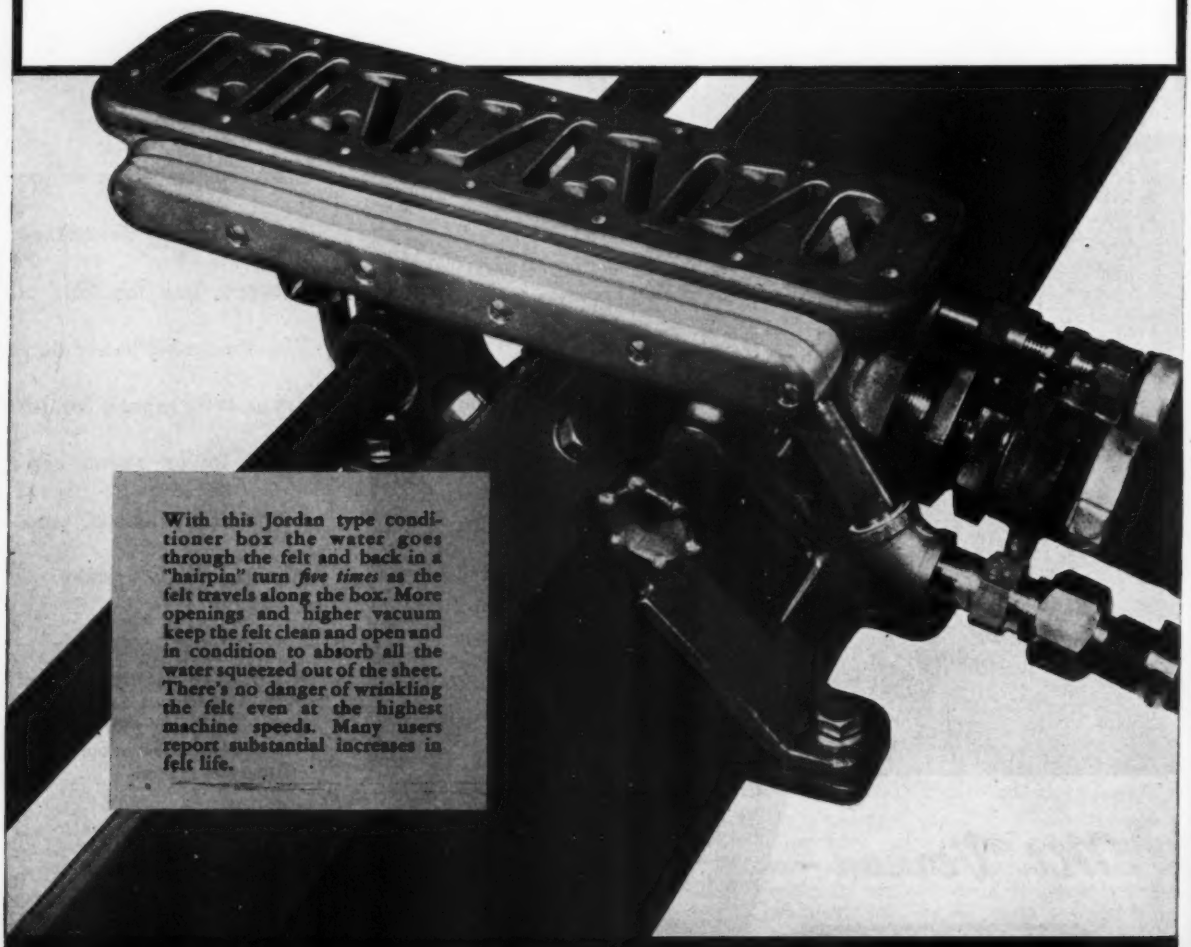
HOW CAN YOU DO WITHOUT THIS UNDER TODAY'S CONDITIONS?

The harder and faster you work your press felts, the more you need VICKERY FELT CONDITIONERS with Jordan type conditioner boxes, like the one pictured.

When felts run faster they fill up faster. Yet mid-week machine shutdowns to unclog felts can no longer be tolerated.

That is why so many Vickery Felt Conditioners with Jordan type boxes are going in right now.

How about *your* press felts? Are they equipped to meet today's production demands?



With this Jordan type conditioner box the water goes through the felt and back in a "hairpin" turn *five times* as the felt travels along the box. More openings and higher vacuum keep the felt clean and open and in condition to absorb all the water squeezed out of the sheet. There's no danger of wrinkling the felt even at the highest machine speeds. Many users report substantial increases in felt life.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

1951

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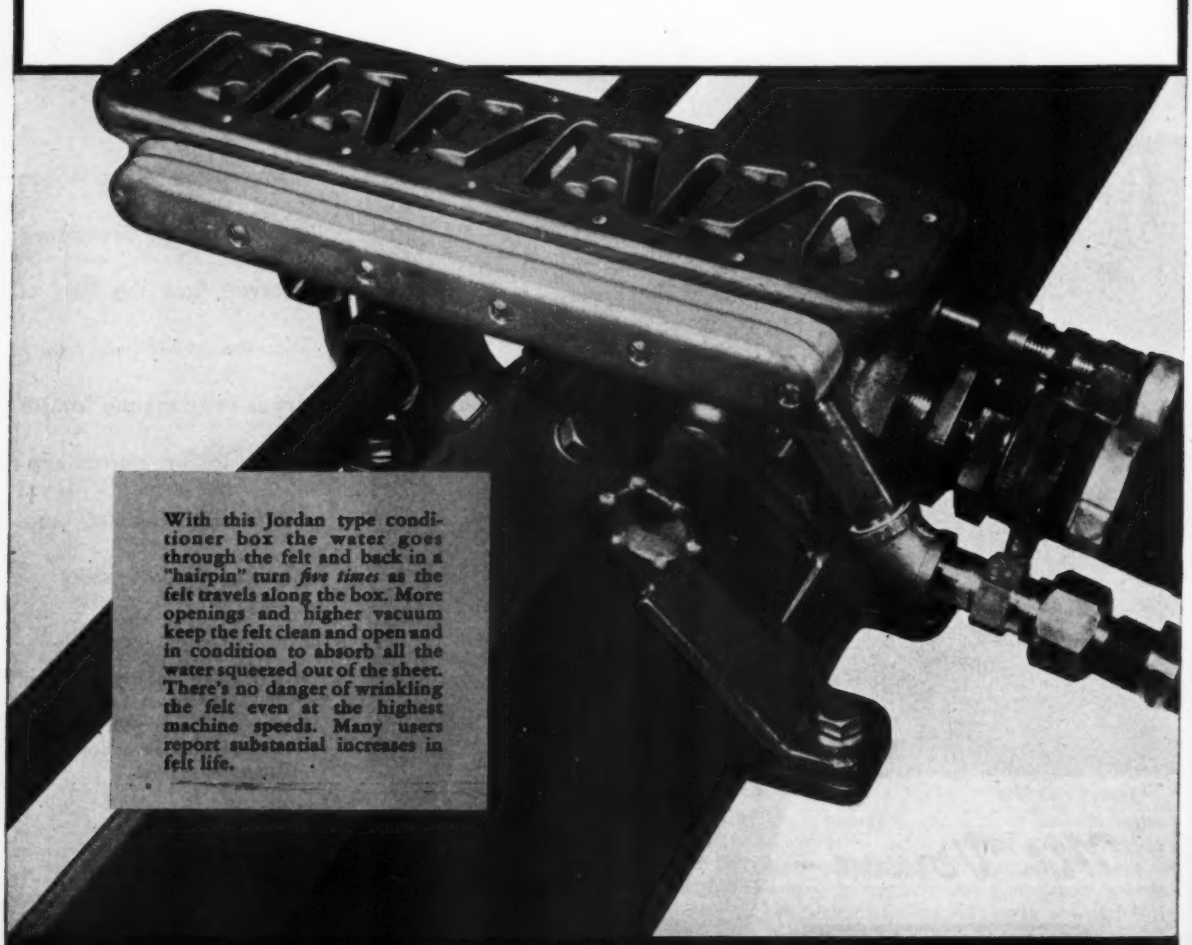
That is why so many Vickery Felt Conditioners with Jordan type boxes are going in right now.

How about *your* press felts? Are they equipped to meet today's production demands?



With this Jordan type conditioner box the water goes through the felt and back in a "hairpin" turn *five times* as the felt travels along the box. More openings and higher vacuum keep the felt clean and open and in condition to absorb all the water squeezed out of the sheet. There's no danger of wrinkling the felt even at the highest machine speeds. Many users report substantial increases in felt life.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

1951

The Paper Industry

August 1951

Tree Farms Help Perpetuate Our Forests

Ghost towns are still being created by our vanishing forests. Recent announcement that a northern Michigan sawmill with its traditional company-owned town was going out of business because its timber supply had been used up, corroborates this fact. Fortunately, the tide is turning on this score. In fact, it actually started turning about a half century ago when early foresters such as Gifford Pinchot began promoting good forest management.

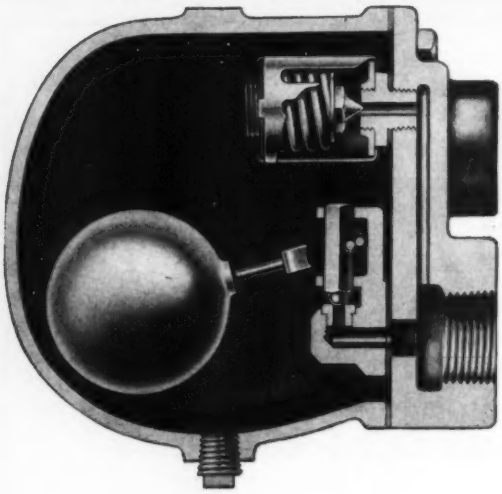
Biggest force today in perpetuating our forest resources is the tree farm movement which recently celebrated its tenth birthday. In 1941 the first tree farm comprising some 120,000 acres of logged over land near the towns of Montesano, Elma and Oakville, Washington, was formed. Owned by the Weyerhaeuser Timber Co., the Clemons Tree Farm, as it was called, was put under scientific management involving selective logging, fire control system and a program of reforestation. As a leader in this movement, Weyerhaeuser has converted much of its timber land to tree farms. Only a few weeks ago a 203,000 acre tract of second growth timber in the Coos Bay area of Oregon was set aside for this purpose. This company now has nearly two million acres of land in tree farms.

Actually, the tree farm idea has been employed in European countries for many years. Only in the late '30's, when most of our virgin timber had already been cut did the forest products industries of this country start showing active interest. Since the Clemons farm was started, the U. S. has gained over three thousand tree farmers in 29 states. From the original 120,000 acres the program has grown to include more than 23,000,000 acres and it is continuing to grow at the rate of about a half million acres every year. While over half the tree farms are owned by small woodlot owners, the bulk of the area involved is under the management of larger timber using industries. Largest tree farm in the country is in Texas, and contains nearly 700,000 acres, a little larger than the state of Rhode Island.

On the big tree farms in the west, for instance, around $35 an acre must be spent for such permanent improvements as roads and firebreaks. Additional expense of over 30c an acre must be paid out every year for maintaining fire patrols and other expenses. One of the biggest problems in raising a timber crop is to prevent fire. Year after year the crop is exposed to fire and this hazard must be met from 20 to 100 years depending on the length of time for the timber to mature sufficiently for harvesting.

As such, tree farming brought nothing new in forest science or techniques. But it has brought a concept of forests as recurring crops. The concept of tree farming has caught the public imagination. To quote W. B. Greely, former U. S. Chief Forester, "It has translated forestry into common, workaday terms. 'Silvaculture' seldom emerges from the pages of professional and scientific journals but 'Tree Farm' is a language of the people, of newspapers and popular magazines, or the radio and advertising and television. It has become a powerful aid in winning the understanding and cooperation of the public in keeping fire out of our forests . . . Every American child knows what a farm is. 'Tree farm' tells the whole story—of forest protection and growth, of a new crop of wood following every harvest."

Quite naturally it takes more than a few years to rehabilitate forest areas subjected to destructive timber harvesting practices followed since early colonial days in this country. But already good forest management is beginning to pay off. In 1918, for instance, nearly 6 trees were cut for every new tree that sprouted. This year the ratio has dropped to about 1 for 1. If tree farming continues this rate of growth, the nation will eventually grow more wood than it uses.



COMMON SENSE approach to

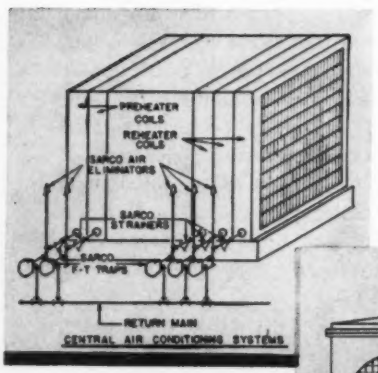
TRAP SELECTION FOR UNIT HEATERS

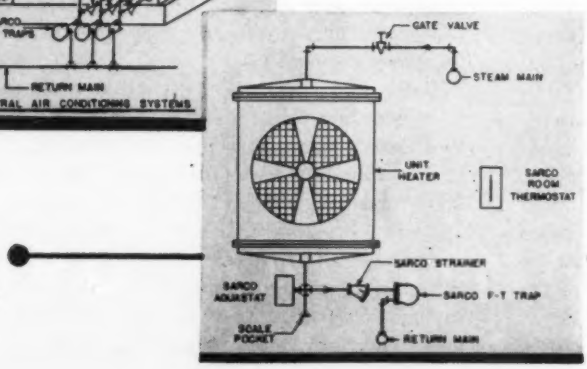
what are the requirements for efficient unit heater or blast heater drainage?

1. High starting load capacity to deal with cold air and low steam pressure resulting from peak load.
2. Free discharge of incóndensables on starting and during running.
3. Continuous condensate discharge to prevent hot and cold air blasts.
4. Release of condensate at or near steam temperature.

why is the Sarco type FT the ideal steam trap for such heaters?

1. The float operated main valve can be sized to handle the condensate loads from the lowest pressures up to maximum design pressure.
2. The built-in air vent prevents air binding under starting or running conditions.
3. Sarco F.T traps discharge condensate continuously, as soon as it forms—don't need to cool or to wait until steam leaks out of buckets before they fill and discharge.
4. The float level and, therefore, the valve opening is controlled by the rate of condensate flow into the trap. On no load, the valve is closed.





New Bulletin 455 contains full information on latest improvements.

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The Paper Industry Current Comment

Congress restrains Administration controls

The twin battlefields of Washington and Korea have had the nation in a political dither for a month. Whether the prospect of peace of a sort in Korea means a continuance of the ultimate in the defense mobilization or whether conditions have so changed as to permit an easing of the pressure against inflation has kept Congress and the defense agencies in debates through all of July.

Congress in June refused to grant the President all the authority he asked for the defense program and extended the mobilization law for one month. Then came the battle by the Administration to have strong controls retained, but a preponderantly Democratic congress has been constantly stepping on the Presidential toes. Protests against rigid controls which have only been rigid as to industry, but not as to labor, have involved repeated charges that the Administration has attempted to use the cold war as an excuse to put into effect socialistic proposals such as socialized medicine and operation of industrial plants. The manner in which members of the United Nations have failed to do their share in Korea has led to objection to the large additional appropriations for European rearmament and the grant of funds to improve the economics of foreign nations.

It is apparent that Congress is in the saddle and that the President in any new measure to become effective in August will have to be satisfied with far less authority than he demanded. The principal complaint of Congress in its refusal to grant added authority is the charge that the President has not used the power originally given.

The action of Congress in forbidding price rollbacks in the period between July 1 and July 31 was taken advantage of by the Office of Price Stabilization to issue orders denying any price increases and freezing all prices at the figure in effect prior to July 1. Price increases announced by leading book paper manufacturers were vetoed by this order, and the same effect was felt in various other grades. Price increases thus vetoed amounting to from $6 to $10 per ton, dependent on the grade, were then scheduled to become effective August 1.

Administration hopes for a series of TVA projects in all parts of the nation were demonstrated this summer at a conference of New England-New York industries and federal agencies. The issue of private versus public control of water power and the flow of rivers will become an important political issue in this region, as well as elsewhere. One college professor criticized the TVA idea as starting at the end, instead of the beginning, of the economic picture. He said that 45,000 small dams installed on New England farms would make unnecessary any great power projects in the lower river valleys. Massachusetts speakers were vigorously against the installation of a TVA project in New England.

Newsprint allocated

The heat of debate in Congress over defense legislation has caused a temporary cessation in the talk of legislation to solve the newsprint supply situation. However, the International Materials Conference has decided to make special grants to six nations out of contracts held by Canadian and United States producers. Allocations are to be made on the basis of the following monthly tonnage: France, 3,000 tons; Greece, 1,500 tons; India, 2,400 tons; Malaya and Singapore, 650 tons; Pakistan, 500 tons; Philippines, 2,500 tons, and Yugoslavia, 2,000 tons. Other nations may be included later.

Action to relieve converting paper mills in short supply of pulp has been taken by the National Production Authority by requiring all producers to reserve 3 per cent of their output for sale to non-integrated mills. The mills are required to cut their production to 95 per cent of the 1950 rate of production, and users are limited to a 45-day inventory at normal consumption.

Need metal for wires

A particular difficulty for various paper mills under the defense mobilization program is being felt in various supply lines, particularly in the field of fourdrinier wires. Weavers using stainless steel have been denied supplies and many looms have been idle, the Government agencies failing to recognize that the time lag between the authorization for purchases of such steel and the time when the finished wires reach the mills may have an unsettling effect on paper production.

Paper industry aids forestry

Increasing attention is being given to the manner in which the paper industry has played an important part in the preservation of the forests and the restocking of cut-over lands. An example is in the formal statement by Chief U. S. Forester Lyle F. Watts to a group of Congressmen to the effect that it was a great day for the South when papermaking from southern pine was made practical.

"The development," he said, "brought a demand for small-sized trees that made intensive forestry possible, the dream of practicing foresters."

He said that eight years ago in Florida and Georgia he found wild forest fires everywhere and few planted forests. Today he finds few forest fires and many, many acres of planted forests.

In seven years of education some 4,000 boys have been the guests of southern pulp mills and shown the possibilities of profits to owners of small forest tracts. Thus, the paper mills are looking toward the future by educating the young, while spending enormous sums in practicing true forestry on lands which they own themselves.

Paper center dislocated

New York's downtown paper center has been disturbed by announcement that 41 Park Row has been sold to a corporation which announced that no extensions will be granted to lessees. Nearly 40 companies interested in paper production and sales, and paper mill supplies will be affected before next summer.

Financial reports

Paper mill securities showed strength during early July as compared with the shaky tendency for many other industrial securities.

Chesapeake Corp.—Net income for six months ended June 17 was $1,578,178 as compared with $1,405,313 for the comparable period a year ago.

Masonite Corp.—Net income for nine months ended May 31 was $2,014,031 as compared with $4,794,290 for the comparable period a year ago.

Mead Corp.—Net income for six months ended June 17 was $3,112,433 as against $2,406,916 for the comparable period a year previous.

Keyes Fibre Co.—Net income for six months ended June 30 was $771,580 as

Two Rugged STOCK PUMPS FOR THE PAPER INDUSTRY

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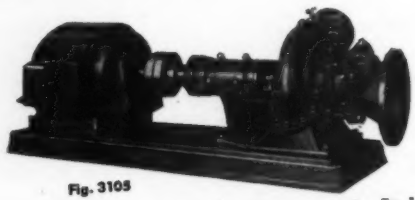

Fig. 3105

This pump is specially designed to handle paper stock. It is ruggedly built to give long, trouble-free service. The following desirable features are incorporated in all sizes:

- Horizontal discharge to prevent air binding
- Renewable wearing parts
- Adjustable axial clearance between rotating and stationary parts
- Backwall ejector vanes on impeller to prevent binding of stock behind the impeller and also give hydraulic thrust balance
- Various size suction pieces available. Each has large hand hole for easy cleaning

This heavy duty, open impeller model pump will deliver 250 to 4000 G.P.M. at heads up to 220 ft. Available in sizes 4″, 6″, and 8″.

DURABLE, VERTICAL CENTRIFUGAL PUMP

Here is another rugged pump built especially for paper mill operation . . . being vertical type, requires minimum amount of floor space. The following features make this an exceptionally dependable unit for stock transfer service:

- Axial adjustment between rotating and stationary parts
- Renewable wearing parts
- Backwall ejector vanes on impeller to prevent binding of stock behind the impeller and also give hydraulic thrust balance
- Large, direct passages
- Ample flushing and drain connections for easy cleaning

Fig. 3115

Fig. 3115 has capacities of 150 to 2000 G.P.M. at heads up to 180 ft. Sizes 4″, 5″, and 6″.

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MEMBER

compared with $603,138 a year ago.

Container Corporation—Net income for six months ended June 30 was $8,937,000 as compared with $4,458,000 a year ago.

Kimberly-Clark Corp.—Net income for the year ended April 30 was $12,052,618 as compared with $8,533,254 for the previous fiscal year.

St. Regis Paper Co.—Net income for six months ended June 30 was $9,189,273 as compared with $4,212,281 in the same period a year ago.

Sorg Paper Co.—Net income for three months ended March 31 was $235,177 as compared with $201,766 for the same quarter in 1950.

Hudson Pulp & Paper Corp.—Net income for seven months to March 31 was $1,882,228 as compared with $1,817,250 for the entire fiscal year ended Aug. 31, 1950.

Puget Sound Pulp & Timber Co.—Income for the first quarter was $1,140,056 as compared with $233,119 in the same quarter of 1950.

Central Paper Co.—Net income for nine months to March 31 was $350,167 as compared with a net loss of $406,859 for the same period a year ago.

National Container Corp.—Net income for the March quarter was $2,928,000 as compared with $936,000 for the same quarter in 1950.

Philip Carey Mfg. Co.—Net profit for the March quarter was $815,688 as compared with $94,414 a year ago.

New York Stock Exchange—Stocks
(Closing Prices)

	July 19, 1951	June 20, 1951
A.P.W. Products	* 7-7⅛	7¼
Celotex	16⅛	16¼
Same Preferred	* 16½-16¾	16⅞
Certain-teed Products	16¼	15
Champion P&F Co.	59⅞	54⅝
Same Preferred	*102¾-103½	*102½-103
Chesapeake Corp.	* 36-36½	33
Continental Diamond	14	14⅛
Container Corp.	39⅜	37½
Same Preferred	102	*102½-103
Crown Zellerbach	53	52⅞
Same Preferred	101	102½
Dixie Vortex	64	59½
Same "A"	63⅛	* 58¾-59½
Eastern Corp.	25¼	21½
Robert Gair	13¾	13⅜
Same Preferred	19	19
Gaylord Container	28	27
International Paper	49⅝	50⅛
Same Preferred	102¾	*101½-102½
Kimberly-Clark	45½	46
McAndrew & Forbes	* 40-40¾	* 39¼-40
Marathon	47⅝	48
Masonite	30	32
Mead Corp.	* 23½-24½	25¼
Same Preferred	* 90-91	* 90¾
Same 2nd Preferred	* 58-64	* 61-66
National Container	12⅝	13¼
Rayonier, Inc.	59⅞	53⅝
Same Preferred	36	* 35⅝-36
Scott Paper	* 50⅜-51½	50¼
Same $3.40 Preferred	89	90
Same $4 Preferred	102	*106-107¼
St. Regis	15	14⅛
Same Preferred	* 90½-92	90
Sutherland Paper	24⅜	25
Same Preferred	106⅝	106⅜
Union Bag & Paper Co.	43⅞	45⅝
United Board & Carton	16⅜	* 17⅜-18⅛
United Wall Paper	* 3¼-3⅜	* 3⅜-3½
U. S. Gypsum	112¾	107
Same Preferred	*175½-180	*172½-177
West Va. P. & P. Co.	* 82-84	* 82½-84½
Same Preferred	*106½-108	*106½-108

New York Stock Exchange—Bonds

A.P.W. Products	91½	91½
Celotex 3¾%	100	102
Champion P&F Co. 3%	101	101½
Mead Corp. 3%	100	100

New York Curb Exchange—Stocks

Am. Writing	10⅛	10⅛
Great Northern	52⅝	51⅜
Hammermill	40	41

*Closing Bid and Asked Prices.

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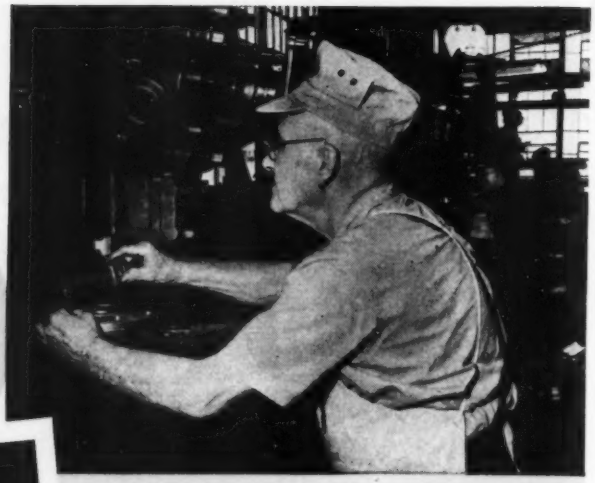

Mr. Claude Waltz, operating a Bullard high-speed boring mill here, started at OIC in 1896, at age 19, as an apprentice machinist.

This new, modern Southwark-Emery physical test machine, in daily use, is one of the many mechanical aids added to the 40 years of precision engineering experience of Messrs. Malaney, Doster and Turner.

Mr. A. A. Kruse, factory trained in precision application of valves, is one of many O. I. C. representatives in various parts of the nation qualified and available to aid both distributors and users in valve application.

Precision Engineering of valve designs, Precision Manufacturing and Precision Application—OIC considers all three factors equally essential to good valving. OIC has the years of experience and the service organization to give you all three.

We point with pride to these veteran members of the OIC organization as evidence: Mr. Claude Waltz has been contributing precision machining for 54 years. Mr. D. B. Malaney, Metallurgist, Mr. H. G. Doster, Vice President in Charge of Engineering, and Mr. J. B. Turner, Product Engineer, combine 40 years of service in precision engineering. Mr. A. A. Kruse, Jr., who began in our Engineering Department, is now one of the many field engineers advising users on precision valve application in various parts of this country.

If you're needing valve *application know-how,* call the nearby OIC distributor for the help of a factory representative, or write direct to us. The Ohio Injector Company, Wadsworth, Ohio.

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News of the Industry

Alaska Timber Deal Closed

Ketchikan Pulp & Paper Co. to build 300-ton Pulp Mill at Ward Cove near Ketchikan

The largest sale of national forest timber ever made was completed by the Agriculture Department's Forest Service on July 27 in awarding a final contract for 1,500,000,000 cubic feet of Alaskan pulp timber to Ketchikan Pulp & Paper Co., Bellingham, Wash.

The timber, located on the Tongass National Forest in southeast Alaska, has been estimated by officials to be sufficient to supply a pulp mill of 500 tons daily capacity for 50 years. The cutting contract expires June 30, 2004.

Lawson P. Turcotte, president of Ketchikan, was present in Washington to close the sale. The firm is owned partly by American Viscose Corp., New York, N. Y., and partly by Puget Sound Pulp & Timber Co. of Bellingham, Wash. A spokesman for the Agriculture Department reported that terms of the contract require the construction of a pulp mill of 300 tons daily capacity in Alaska by the purchasers. A site for the proposed mill has already been acquired at Ward Cove near Ketchikan.

The Defense Administration has approved an application for a necessity certificate submitted by Ketchikan for a $40,000,000 pulp mill. The approval came shortly after the National Production Authority announced that it had also given its o.k. to the project. This certificate of necessity permits 65 per cent of the cost to be written off for tax relief.

High alpha dissolving pulp is to be produced, according to the report of the sale. Such pulp is suitable for rayon and cellophane, as well as for nitro-cellulose, a basis for explosives.

Ketchikan has agreed to pay 85 cents per hundred cubic feet for timber cut for pulp prior and up to July 1, 1964. For timber intended for manufacture and sale in forms other than pulp the contract calls for the following rates: $3 per thousand board feet for spruce sawlogs, $1.50 a thousand for cedar, and $2 a thousand for sawlogs of hemlock or other species. These rates are to be reappraised by the Forest Service after 1964 and at five-year intervals thereafter.

The bulk of the timber covered in the bid is on the northerly portion of Prince of Wales Island. It is 75 per cent hemlock and the balance mainly Sitka spruce, with small amounts of Alaskan and western cedar.

The Ketchikan sale, marking the first step in the opening of the territory's vast pulp timber supply, is the result of 30 years' effort to bring the pulp and paper industry to Alaska. The timber resources have been reported by officials of the Agriculture Department to be the largest still untapped on the continent.

Included in the contract were requirements for conserving natural resources. These involve handling timber on a sustained-yield cutting plan, preserving salmon spawning streams, prevention of water pollution, and preservation of scenic values.

Keady Resigns Marathon Post

William L. Keady has announced his resignation as president and general manager of Marathon Corp., Menasha, Wis., "because of differences in management policies." He will be succeeded by D. C. Everest, board chairman, who is to hold both positions. Mr. Everest had been president for many years prior to the election of Mr. Keady on February 28, 1950.

From 1942 until 1950 Mr. Keady was president of United States Gypsum Co. under the chairmanship of Sewell Avery. Policy differences led to his resignation there also.

Marathon officials have been reported as saying that Mr. Everest will hold the presidency permanently, and that no plans are under way to obtain a successor to Mr. Keady.

Apprentice Foresters Study Chemical Debarking

The woodlands department of the Kimberly-Clark Corp., Neenah, Wis., is again sending student foresters into its timber holdings in Michigan and Canada. Approximately 40 students are on the payroll.

Working in cooperation with Michigan State College, Kimberly-Clark assigns the young woodsmen to such tasks as measuring the timber, sketching forestry maps of the size, number and species of trees, and working on sample plots to study growth, yield, mortality, and regeneration. This summer the apprentices, all members of cruising parties, will make a special study of the chemical treatment of trees for debarking, using three different chemicals in combinations in an attempt to determine which is the most economical and effective.

More than half of Kimberly-Clark's woodlands staff once served as forestry apprentices. According to a company spokesman, the concern makes no commitments as to future employment for the students.

Newsprint Production in June at All-time High

June newsprint production of 558,405 tons in the United States and Canada established an all-time high for any month on record. The report was made by the Newsprint Service Bureau and the Newsprint Association of Canada.

United States output totaled 94,073 tons, while Canadian production reached 464,332, up 5.3 per cent from June, 1950. Canadian shipments of 475,034 and U. S. shipments of 97,016, a total of 572,050, were reported. Canadian shipments to the U. S. in June amounted to 413,771 tons, a gain of 5.8 per cent over the same month last year, and compared with 422,372 in May of this year.

Total production for the first half amounted to 3,299,513 tons, a 7.2 per

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cent increase over the comparable period in 1950. U. S. production was up 13.6 per cent, while Canadian output was up 6.1 per cent.

All continental mills have reported that stocks of newsprint on hand at the end of June dropped to 142,500 tons, compared with 156,145 a month before and 168,031 on June 30, 1950. According to the American Newspaper Publishers' Association, publishers' stocks on hand and in transit on June 30 totaled 452,625 tons, or equal to 37 days' supply, compared with 382, 459, or 30 days' supply, at the end of June a year earlier.

Newspaper Group Buys Paper Mill

Purchase of the Hennepin Paper Co. mill at Little Falls, Minn., was reported recently at Tulsa, Okla. The property was sold to a group consisting of seven newspapers and a New York newsprint broker.

Owned by St. Regis Paper Co., the mill was purchased for approximately $1,500,000 and was to be taken over by the new owners about August 1. According to the announcement, output will be used to provide the purchasers with their newsprint requirements. However, present contracts will be completed.

Newspapers involved in purchase are the *Cleveland News*, the *Cleveland Plain Dealer*, the *Tulsa World*, the *Tulsa Tribune*, the *San Antonio* (Tex.) *Express*, the *San Antonio News*, and the Charleston, W.Va., *Gazette*. Walter D. Peek of New York City, a broker, was also interested in the transaction.

Crown Zellerbach Boosts Newsprint Price

A $10-a-ton increase in the price of newsprint has been confirmed by Crown Zellerbach Corp., San Francisco. The change took effect August 1.

In announcing the new price a company spokesman declared that the increase had not been discussed with OPS. He gave as a reason the fact that the situation as to OPS legislation seems a bit uncertain at the present time.

Finnish Newsprint Raised $9

The New York price of Finnish newsprint was raised $9 per ton to $125 on August 1. The increase is to be effective through December 31, at which time the price may revert to prevailing U. S. cost.

Officials of Finnish newsprint producers called the increase necessary due to excessive bidding for wood in Finland by England, France, Germany, Norway, and Sweden. The cost of wood, they say, is approximately two and one-half times the current cost per cord in North America. A second major reason for the new price is the increase in the Finnish export tax on newsprint shipments, which has cost the mills $9.80 per ton since April 1.

The West German Government

has allocated $1,000,000 to newspaper publishers for the purpose of buying newsprint in the United States and Canada. German newsprint production capacity is 14,000 tons per year.

Waste Paper Prices Drop

Waste paper on the Chicago market was reduced $2 to $10 per ton August 1 as heavy accumulations continued to plague traders. The reduction that affects the largest volume waste material was in news, when mills slashed their buying price $2 a ton to $20.

The deepest cut came in white news blanks, which fell $10 per ton to $70. Mixed paper at $20 and old corrugated cartons at $52 were unchanged from July. Other reductions were made in kraft chemical bags, which were cut $5 to $80 a ton; books, down $5, and brown wood shavings, down $10.

Some price decline in waste paper can be expected seasonally at this time of year. Summer collections are relatively heavy, but this year's collections have been very high, with mill stocks of scrap at the highest point since the war.

Mill Expansion Plans

Union Bag and Paper Corp.

is reported to be planning an estimated $16,000,000 expansion program at its Savannah, Ga., plant. The project will add a new paper machine and equipment for the manufacture of semi-chemical pulp through the use of gum or hardwood trees.

Champion Paper & Fibre Co.,

Hamilton, Ohio, has been awarded a certificate of necessity by the Defense Production Administration for $43,500 for the expansion of bond paper production facilities.

Kimberly-Clark Corp.

plans to increase the capacity of its Memphis mill to 200 tons a day by next year. A third crepe wadding machine, which increases production by 50 per cent, has already been put into operation. A fourth similar machine is included in the expansion plans. The program has been estimated to cost about $2,000,000.

Brunswick Pulp and Paper Co.

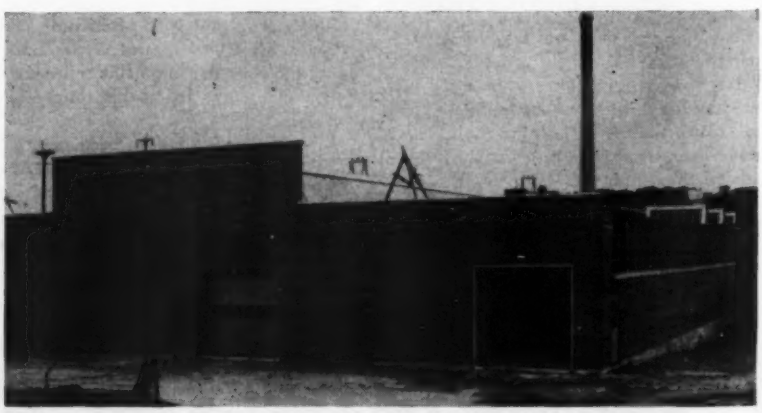
has purchased a 250-acre industrial plant site adjacent to its mill in Brunswick, Ga. Part of a multi-million-dollar expansion program, the land is to be used for an extension of the present mill.

Crossett Paper Mills

has been reported to have let a contract for the construction of a plant to produce an oil for the manufacture of paints, varnishes, linoleum, and soaps. The oil will be produced by a process of acidulation from whole tall oil.

Buckeye Cellulose Corp.,

an Ohio firm recently organized at Cincinnati as a subsidiary of the Proctor & Gamble Co., will produce cellulose from wood at a plant to be located somewhere in the South. The firm will take over the manufacture and sale of prod-



CRYSTAL TISSUE CO., Middletown, Ohio, recently completed this $75,000 addition to its plant. It will be used by Crystal and its subsidiary, Crystal Waxing Co. Besides providing shipping and storage facilities, the building will be used to expand the manufacturing and converting operations of Crystal Waxing. New converting and manufacturing equipment is now being installed.

ucts originally contemplated by the Buckeye Cotton Oil Co., of Memphis, Tenn., another P&G subsidiary.

Hudson Pulp & Paper Corp.

has been awarded tax benefits on a $9,000,000 construction program for its Palatka, Fla., kraft plant. The Defense Production Administration authorized the firm to write off 60 per cent of the cost.

Champion Paper & Fibre Co.

was recently awarded tax benefits by the Defense Production Administration for its $1,047,710 expansion program at the Canton, N.C., bleached chemical pulp plant. The firm has been granted permission to write off 65 per cent of the cost.

Mead Corp.,

Dayton, Ohio, is reported to be planning the construction of a $21,000,000 paper board plant near Rome, Ga., on the Coosa River.

Trinity Bag and Paper Co.,

New York, N. Y., is reported to have purchased a 30-acre site for a paper bag manufacturing plant in Yulee, Fla.

Hooper Co.,

Taylorville, Ill., has been granted permission by the National Production Authority to retire half of its $1,500,000 plant investment in five years. The amortization is permitted by a certificate of necessity issued by the NPA. Under the expansion program announced in March the firm will be able to produce about 27,000 tons of paper annually.

Kieckhefer Container Corp.,

Camden, N. J., is reported to have let contracts for the construction of a kraft paper conversion plant in Jacksonville, Fla. It is said that the floor area of the building will be about 25,000 square feet. Kieckhefer operates one other Florida plant.

Crown Willamette Paper Co.,

San Francisco, is said to be planning a $2,000,000 plant in Los Angeles. A spokesman for the firm, a subsidiary of Crown-Zellerbach, said the project would have a floor area of about 300,000 square feet.

White Star Paper Co.

a subsidiary of Dierks Lumber and Coal Co., Kansas City, is delaying the construction of its proposed multi-million dollar paper mill near Prescott, Ark., despite the Defense Production Authority's approval of a tax amortization program. A spokesman for White Star has announced that, although the certificate of necessity granted by the DPA was needed, the priority for building materials is the big problem. The subsidiary firm is reported to be planning an $18,000,000 investment.

ISRAELI MILL CONSTRUCTION is initiated as final contracts are signed in New York. L to R: seated—Ralph E. DeSimone, Merritt-Chapman & Scott, Joseph M. Mazer, board chairman for Israeli American Paper Mills, Ltd., and Robert Szold, chairman of the Palestine Economic Corp. Standing—Myles C. McGough, Merritt-Chapman & Scott; Aaron Baroway, and Julius Simon, Palestine Economic Corp.

Multi-million Dollar Mill To Be Built in Palestine

The first paper mill to produce printing and writing paper in the Middle East is to be constructed in Palestine. According to an announcement from the Palestine Economic Corp., construction is to be started this Fall, with completion planned for 1953. The cost will be $3,500,000.

Plans for the project were jointly announced by PEC and Joseph M. Mazer, treasurer of Hudson Pulp and Paper Co., New York, N.Y. Hudson is the major stockholder. The mill will be operated by American Israeli Paper Mills, Ltd., with Mr. Mazer as chairman of the board of directors.

Design and construction will be under the direction of Merritt-Chapman & Scott Overseas, Inc. In addition to writing and printing paper, the mill will produce Kraft multi-wall bag paper, with an annual output of 12,000 tons. Exclusive of newsprint and tissue papers, it is estimated that the new plant's output will meet 60 per cent of Israel's over-all paper requirements.

The mill will be constructed on a 20-acre site at Hadera. All sulphite, kraft, and groundwood pulp will be imported, most of it from Scandinavia. Stock preparation equipment, a 120 inch Fourdrinier, steam boilers, and converting equipment will be housed in the plant's main unit. Electric power will be used, but provision is to be made for the possible later installation of an independent steam-turbo generator system. As a conservation measure, a re-circulating system has been designed for the mill, which will reduce water consumption by about half.

Mexican Mill Planned

Construction of a Mexican cellulose plant is to begin sometime this year, according to an announcement by Carlos Trouyet, Mexican financier. The project is to be located in the state of Chihuahua and will cost an estimated $17,500,000 (150 million pesos). Mexican capital is to be used almost exclusively in the undertaking, which will be known as Celulosa de Chihuahua, S. A.

Mexican technicians were to leave for Milan, Italy, to study factory construction and production methods used by the rayon manufacturers of that country. Possibilities of the plant making newsprint are being studied. It is expected that most of the required machinery and other equipment will be purchased in Italy.

St. Regis to Build Ontario Bag Plant

The St. Regis Paper Co., Ltd., has announced the construction of a multiwall bag plant at Dryden, Ont. The new factory will replace one now leased from the Dryden Paper Co., Ltd., and is to be completed this year.

According to an announcement by Thomas H. Cosford, vice president and

managing director, the installation will provide a capacity three times that of the present plant and will increase employment about 50 per cent.

The new factory will be a one-story structure covering 73,000 square feet. It has been designed for the ultimate installation of three tubing units capable of producing a full range of multiwall bags of virtually all specifications. Space is also being provided for the eventual inclusion of extrusion equipment for the coating of kraft paper with polyethylene.

J. M. Harnit, vice president in charge of multiwall paper bag manufacturing, is in general charge of the construction and will be in charge of subsequent manufacturing operations. Clarence M. Witt, manager of the present Dryden plant, will assume the same position in the new operation.

Zellerbach Paper Co.,
San Francisco, has announced plans to construct a $250,000 warehouse in Spokane, Wash. The firm, a Crown-Zellerbach subsidiary, recently purchased the site from the Union Pacific and the Chicago, Milwaukee, St. Paul & Pacific railroads. A company spokesman reported that the proposed structure will contain 20,000 square feet of floor space. No date has as yet been set for beginning the project.

St. Regis Paper Co., Ltd.
(Canada) has announced that production of laminated plastics has been started at its new mill in St. Johns, Que. The $2,000,000 plant will produce industrial, refrigeration, and decorative plastics. Covering 70,000 square feet, the mill is equipped to produce refrigeration molded parts, industrial sheets, tubes and rods, specialty fabricated shapes, and decorative applications. Charles L. Walters is plant manager.

Three Canadian paper firms
are reported to be increasing their productive capacity for making book, magazine and other similar papers. The companies said to be expanding operations are Howard Smith Paper Mills, Ltd., Provincial Paper Ltd., and E. B. Eddy Co. The program, which will be completed in either late 1952 or early 1953, calls for an increase of approximately 43 per cent.

Lesavoy Industries, Inc.
have purchased the Pennsylvania General Paper Corp., Coatesville, Pa., from the West Disinfecting Co. The mill is now manufacturing industrial paper toweling and cable wrapping and is equipped to produce a variety of papers for industrial use. It is reported that production capacity is to be enlarged and improved.

Rayonier Elects Morgan President

Clyde B. Morgan, long prominent in the pulp and paper industry, has been elected president and a director of Rayonier, Inc., New York, N. Y., manufacturer of dissolving pulp.

Mr. Morgan is returning to Rayonier, of which he was vice president from 1937 to 1941. Since 1941 he has been president of Eastern Corp. Prior to joining Rayonier in 1937 he was executive vice president of S. D. Warren Co.

W. G. Reed, who has been acting as the company's chief operating executive since the resignation of Edward Bartsch in 1950, recently resigned his interim position as executive vice president.

William A. Parker, recently named chairman of the board to succeed Charles R. Blyth, has announced that James T. Sheehy has been elected vice president in charge of all operations of the firm. Mr. Sheehy has been a company vice president since early last year.

Mr. Parker also announced that two vice presidents have been placed in charge of mill operations. William E. Breitenbach will direct operations in the Northwest, while Russell F. Erickson will supervise activities in the Southeast.

Eastern Corp.
recently elected Ira D. Wallach to the newly created office of executive vice president. Mr. Wallach, formerly vice president and a director of Gottesman & Co., Inc., and Central National Corp., will be chief executive officer of the company pending appointment of a successor to its former president, Clyde B. Morgan. Mr. Morgan has been elected president of Rayonier, Inc. A director of Eastern since 1947, Mr. Wallach is a member of its executive committee.

Projects for Western Canada

In western Canada generally, and particularly in British Columbia, activity in the pulp and paper industry has developed into a race. Large groups are rushing to establish their plans under the forest management license legislation of the westernmost Canadian province. The entire picture is one of change, rumor and speculation.

Powell River Co. at Kitimat

For some time it has been rumored that a pulp mill would be located near the giant $550,000,000 project of Aluminum Co. of Canada at Kitimat. While Powell River Co. was thought to be the most likely prospect, it was not until recently that any information had been disclosed.

It appears from the first general statements by Alcan that Powell River will build a newsprint, pulp or paper mill near the hydro project at Kitimat. The first logs for the mill would be obtained from the flooded areas created by the hydro project, and the permanent supply will come from the company's own holdings in the Kitimat Valley, where it has about 1½ billion board feet. A further two billion board feet are held on the Queen Charlotte Islands, but, because of lack of power potential there, will be towed across the straits to the new mill.

It has been reported that an aerial tramway will be constructed to carry goods into the power project, and that logs will be taken out by return.

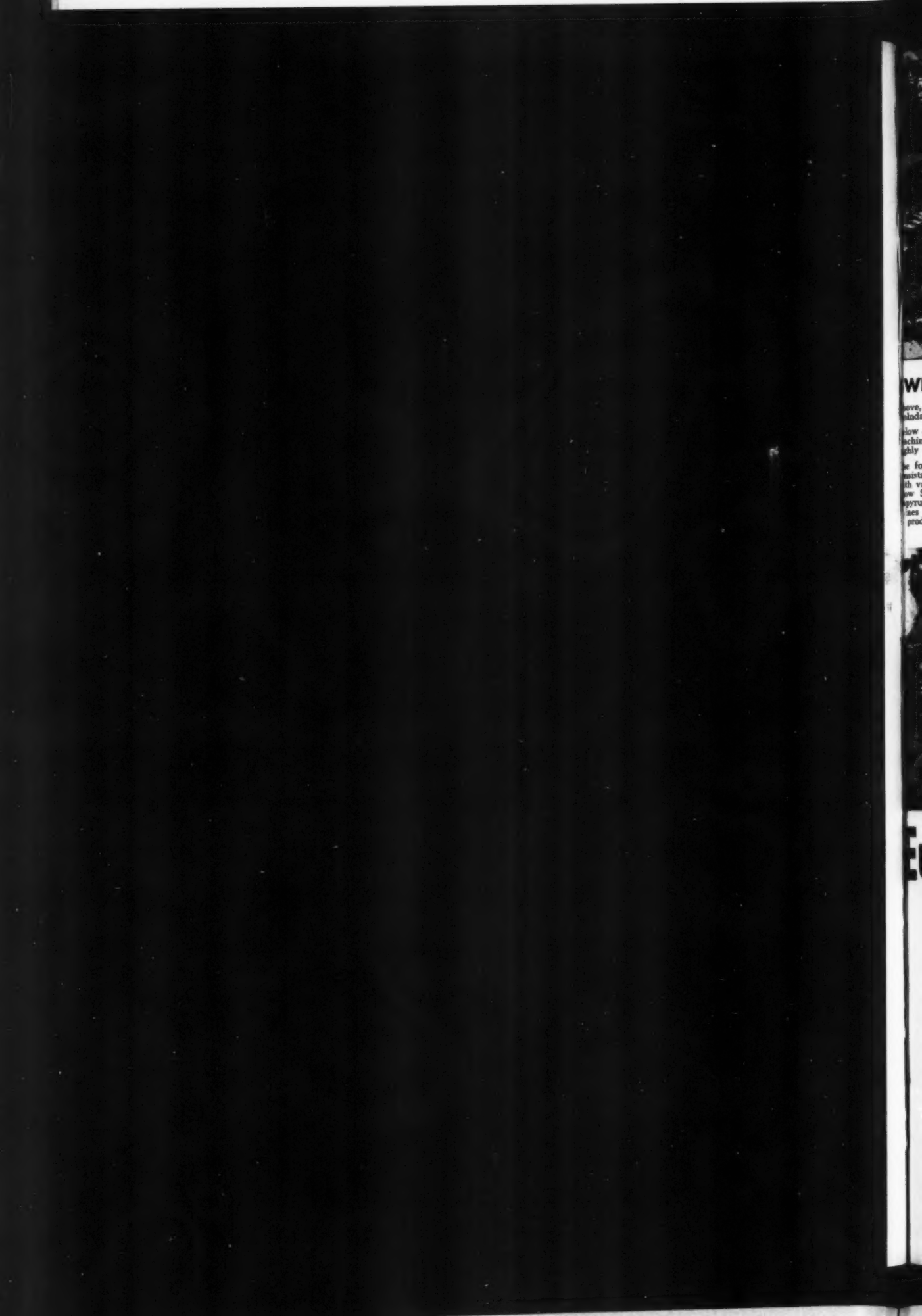
With official opening of the Whatshan power project on the Arrow Lakes in British Columbia came an announcement by the Hon. E. T. Kenney, provincial minister of lands and forests, that a pulp and paper development was planned for the area.

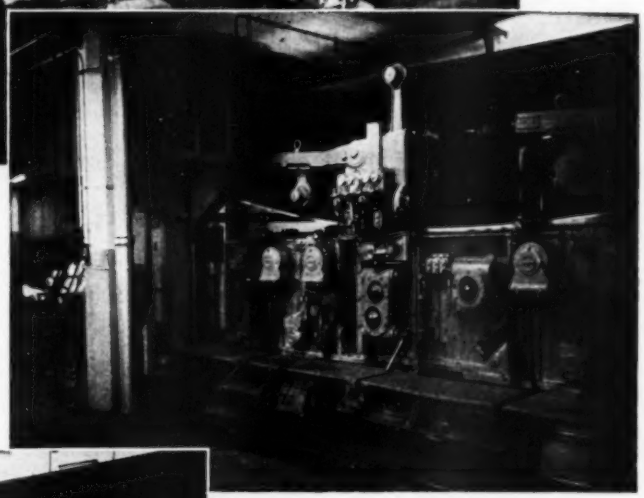
The principal behind the project was not announced, but it is widely held that Celanese Corp. of America (parent company to Columbia Cellulose Co., Prince Rupert, B.C.) has been interested in the area. It is quite possible that the firm is planning the fully integrated, $75,000,000 project announced by the minister. It is thought that the capital would be used to provide a chemical pulp mill, a newsprint mill, a sawmill, a plywood mill, and miscellaneous wood-using industries. Complete integration on this scale is necessary to develop this rich area to its fullest extent, and each of these industries can be supported by stands in the region. The provincial government has been following a policy of industrial diversification, which would account for the inclusion of a newsprint mill.

Although this announcement was made in conjunction with the opening of the Whatshan development, there is not enough power from this project for so great an enterprise. Although most of the 33,000 h.p. produced at present is for rural development, there is sufficient potential in the area to meet the new demand without too much difficulty, a power commission spokesman declared.

Alberta Mill

North Western Pulp and Power Ltd. plans to construct a mill for the production of ground wood pulp near Yates,



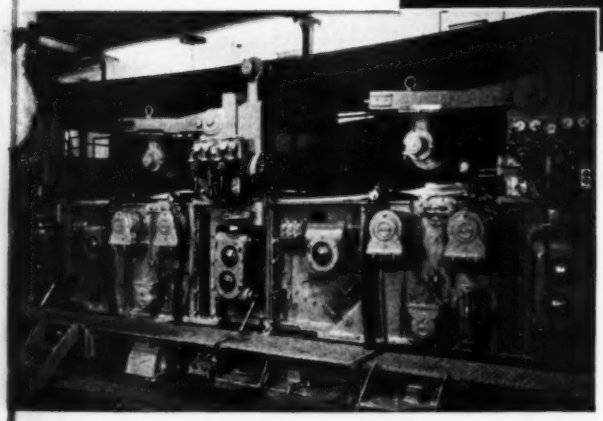


WEDEN LEADS THE WAY

ove, aerial view of the mill of A. B. Papyrus, lndal, Sweden.

low and right, close-up views of the new Cylinder achine with Stream-Flow Wet End which started ghly successful operation in October 1950.

e forming part of the new machine at Papyrus nists of four Vacuum Stream-Flow Vat Systems ith vacuum cylinder molds, 48" dia. x 120" face, w Spreaders, Up-Flow Head Boxes, etc. A. B. pyrus have a total of 13 paper and board ma- nes in operation, making a tremendous variety products, all of the highest quality.



European Papermakers turn to

Stream-Flow Vat Systems

A new cylinder board machine with a forming part consisting of four Goldsmith Vacuum Stream-Flow Vat Systems started up in the mill of A. B. Papyrus, Molndal, Sweden, in October 1950. This machine makes the highest quality European type folding boxboards from sulphite and groundwood pulps with an MG finish produced by a Yankee Dryer. It makes a wide range of sheet weights, namely in caliper from .014 to .050.

This is the second highly successful new machine to start operating in Sweden with Vacuum Stream-Flow Vat Systems during 1950. Stream-Flow Vat Systems are now also on the drawing boards for machines to be installed in France and in England.

When Papyrus selected Stream-Flow Vat Systems as the forming part of their new machine, their choice was based on a wide experience. Their satisfaction with the performance of this new machine is a just reward for their decision not to be content with second-best equipment.

Whatever your product may be – test liner, corrugating board, folding boxboards, high-grade boards or cylinder papers, felt or special products – Puseyjones Stream-Flow Wet End on your new or rebuilt machine will give you the assurance of better sheet quality, higher speed possibilities and furnish economies.

Write or call a Puseyjones engineer today.

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Est. 1848. Builders of Paper-Making Machinery

Fabricators & Welders of all classes of Steel & Alloy Products

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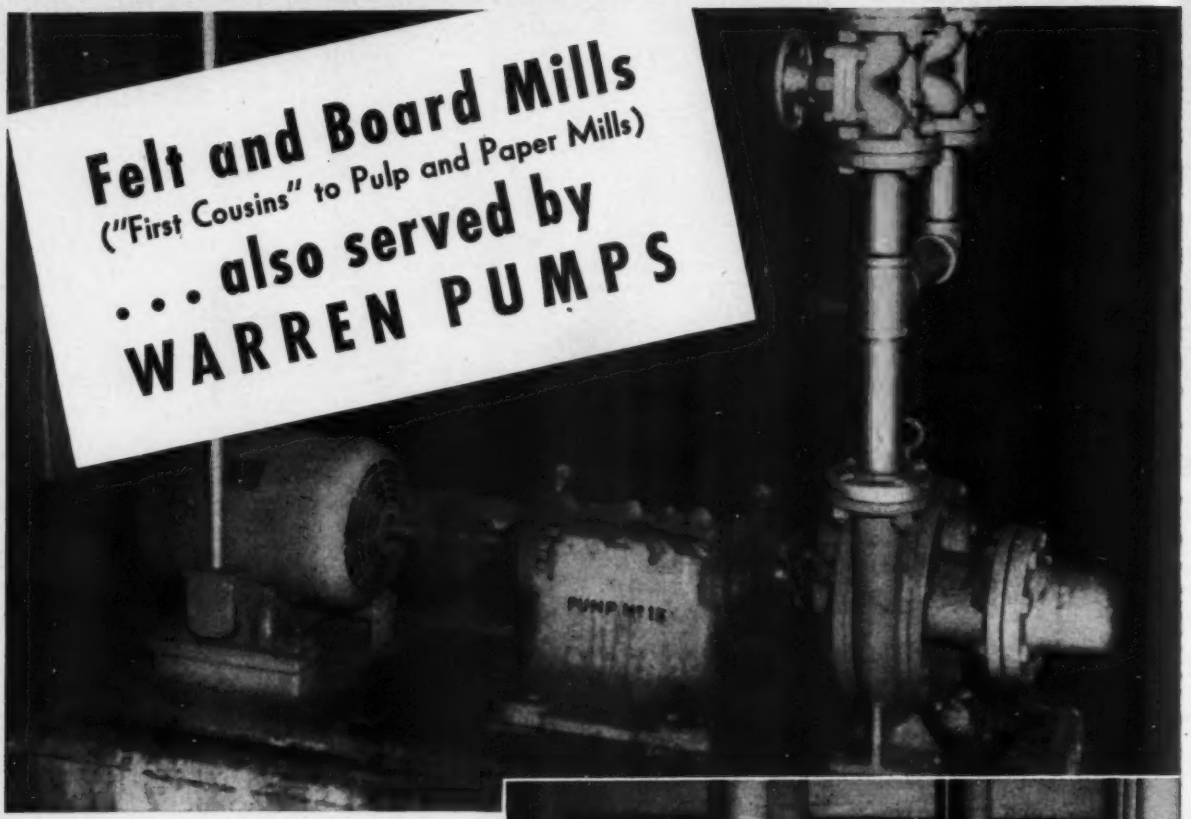
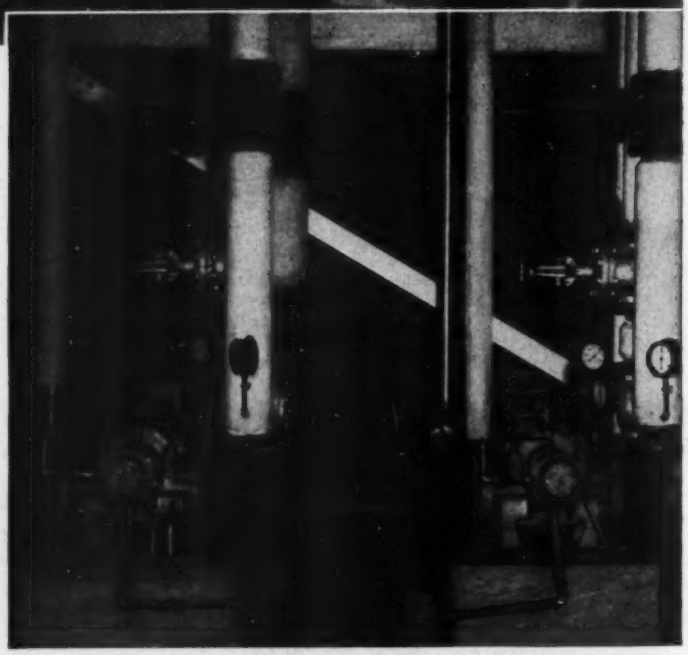
Felt and Board Mills
("First Cousins" to Pulp and Paper Mills)
. . . also served by
WARREN PUMPS



. . . and keeping pace with expansion and improved production methods is Bird & Son, Inc., East Walpole, Mass., Phillipsdale, R. I., Chicago, Ill., and now a new felt mill at Shreveport, La.

Over the years it has been our privilege to have supplied the Bird mills with Warren Pumps for various types of services and our installations in the new Shreveport plant include pumps for handling:

- 3½% Dirty wastepaper stock
- 3½% Semi-liquid chemical wood stock
- 3½% Refined liquid felt stock
- White water
- Fresh water
- 10% Caustic solution
- Boiler Feed
- Boiler make-up water



Top: Warren Pump Handling Caustic Solution. Bottom: Boiler Feed Water Pumps

Modernization or expansion, Process or Power Plant, Pulp, Paper, Felt or Board Mills . . . it will pay you too, to specify:

WARREN PUMPS

WARREN STEAM PUMP COMPANY, INC., WARREN, MASSACHUSETTS

about 125 miles west of Edmonton. According to an agreement between the firm and the provincial government, the minimum value of the plant must be $3,500,000, but it is thought that the contemplated project will cost an estimated $5,000,000.

Completion of the unit must be by May 1, 1954, with provision that chemical or semi-chemical pulp and paper production follows by May 1959 (to be completed by May 1961). About 2,000 square miles of timber have been reserved for the mill.

Wisconsin shows progress in sulphite waste liquor disposal

Technical progress in the utilization of spent sulphite liquor in Wisconsin is lessening that state's stream pollution problem. Working in conjunction with the Institute of Paper Chemistry in Appleton and through their own Sulphite Manufacturers' Research League, pulp and paper mills throughout the state are devoting more and more funds toward research in the field.

More money for research

At a recent meeting of League members, Wisconsin sulphite mills voted to contribute increased funds toward cutting pollution in the next five years. According to the announcement by J. M. Conway, president of Hoberg Paper Mills and of the League, 12 firms that operate 14 mills in the state have ratified the agreement. The member companies boosted the research budget by almost 23 per cent to $145,000 per year. Previous cost of membership was 27½ cents contributed by each mill per ton of sulphite pulp produced. Retroactive to June 1 the assessment will be 33 cents per ton.

More waste liquor for roadbinder

During June, Falls Paper and Power Co., Oconto Falls, completed its first week of utilizing spent sulphite liquor as roadbinder. In attempting to reduce pollution in the Oconto River by finding industrial use for the waste, the firm undertook a substantial program calling for the addition of new equipment. In one week ten miles of gravel roads in Oconto County received three to four coats of sulphite binder from the Falls pulp mill, and more mileage is to be steadily added until the winter freeze-up.

With a 1951 goal of using two million gallons on roads instead of flowing it into streams, Falls Paper and Power installed a 12,000-gallon wooden tank into which the liquor is piped directly from the blow pits. The tank is in temporary use until a larger unit can be obtained and installed.

Working in cooperation with the county road department, mill officials contracted with an Oconto Falls trucker for the services of a 3,500-gallon stainless steel milk truck. It was equipped with a rear-end device for spreading roadbinder evenly across an 8-foot swath and with the necessary controls for operating the entire job from the driver's seat. Application of the binder was undertaken only after consultation with experts from the League, researchers from Flambeau Paper Division of Kansas City Star Co., Park Falls, and Kimberly-Clark Corporation's Kimberly mill. Both of these firms have successfully utilized sulphite waste liquor as roadbinder.

After thorough experimentation it was found that for a previously untreated road three or four applications are necessary, with grading between applications as may be required by the road's condition. It is expected that relatively light applications should then be made about once a month during the Summer as maintenance treatment for stabilizing dust.

It has been estimated by officials of Badger Paper Mills, Peshtigo, another firm experimenting in the use of spent sulphite liquor as a roadbinder, that the cost of treating a mile of roadway varies between $50 and $150 according to the length of haul from mill to construction site. As a general practice in the industry, there is no charge for the roadbinder. The user pays the bare costs of hauling and spreading.

Fertilizer experiments

Another aspect of possible future commercial use of spent liquor is that of fertilization. This mill by-product is now being applied to 16-foot wide strips of planted land on a farm near Kaukauna.

Both types of sulphite liquor produced in Wisconsin are being tested. Two truck loads totalling 2,400 gallons of spent liquor from calcium-base sulphite pulping were first spread on test strips in a corn field before the sprouts had appeared. Later, ammonium-base liquor was applied in a similar field. Experimentation with alfalfa is now under way.

Corn requires substantial amounts of nitrogen, which is normally provided through fertilization with ammonium nitrate after the plants have sprouted. The experimenters at Kaukauna hope that ammonium-base sulphite liquor may supply the chemical in a form useful to the growing crop. Alfalfa requires sulphur for best development, and the current tests are intended to demonstrate whether the sulphur compounds in spent sulphite liquor are in a form available to these plants.

Industry spokesmen have pointed out that the experiment is still too preliminary to indicate the probable outcome. However, they say that if the results prove favorable, this use extended to other parts of the state could substantially reduce pollution in Wisconsin streams.

The tests are being carried out with the full cooperation of the Outagamie County agricultural agent. The digester-strength spent sulphite liquor is being provided by Kimberly-Clark Corporation's Kimberly mill, by Consolidated Water Power and Paper Company's Interlake mill, and by the Sulphite Pulp Manufacturers' League.

Yeast for dogfood

One of the possible uses of spent liquor currently undergoing experimentation is as a yeast base for pet foods. One of the largest orders of torula yeast ever booked was received recently by the experimental sulphite liquor treatment plant at Rhinelander.

Experience has indicated that the yeast process satisfactorily cuts sulphite pollution. But the cost of operating the plant is so high that a pulp mill could afford to use the process only if it can recover a substantial share of the expense by sale of the dried yeast, which is the end product. Thus far, marketing the large volume of yeast produced has been the big problem at the Rhinelander plant, which at times has had as much as 1,200,000 pounds stored in warehouses. The recent sale of 250 tons for dog food exhausted the storage supply.

The Sulphite Pulp Manufacturers' League supports research fellowships at several major universities, as well as laboratories and pilot plants at Appleton. It also supervises technical developments at Lake States Yeast Corporation's torula process plant in Rhinelander. Averill J. Wiley is technical director.

Strathmore Paper Co. Elects President and Board Chairman

Cassius M. Bryan has been elected chairman of the board and F. Nelson Bridgham president of Strathmore Paper Co., West Springfield, Mass. They succeed the late George E. Williamson, who held both offices.

Mr. Bryan joined the firm in 1901 as a repair department employee. He worked in many positions throughout the company, was at one time general superintendent of all mills in both West Springfield and Woronoco, and in 1933 was made vice president in charge of

production. He has been a director since 1925.

Closely associated with financial affairs at Strathmore since he joined the firm in 1910, Mr. Bridgham has held the positions of assistant treasurer, vice president, and treasurer. He has been a director since 1926. Mr. Bridgham is also a director and assistant treasurer of Rising Paper Co., Housatonic; director and treasurer of Premoid Products Inc.; director and president of Day Lumber Corp., Springfield, and a director of Old Colony Envelope Co., Westfield.

Forest Conservation Committee of Pacific Northwest Forest Industries, Portland, Ore., has certified another 18,059 acres of timberland in Oregon and Washington as tree farms. Largest of the four tracts certified was the 10,000-acre Aloha Moclips farm in Grays Harbor County, Wash., owned jointly by Aloha Lumber Co. and M. R. Smith Lumber Co. Other properties include 7,919 acres, owned by Crown Zellerbach Corp., Lincoln County, Ore.; 120 acres, Roy E. Kotula, Pacific County, Wash., and 20 acres, O. E. Osgood, Buckley, Wash.

Weyerhaeuser Timber Co.
has dedicated its 205,000-acre Millicoma Forest near Allegany, Ore., as a tree farm. It is the state's 100th tree farm in the Douglas fir region.

Hammermill Paper Co.,
Erie, Pa., has purchased a 775-acre tract near Titusville containing pulpwood reserves. The land, acquired from W. F. Young of Titusville, embraces 11 properties in Rome, Sparta, Bloomfield, Oil Creek, Wayne and Troy townships, as well as the 3rd ward in Titusville.

Continental Can Co.
has purchased 635 acres in the northern portion of Warwick County, Va., through its Hummel-Ross Division. It is reported that the land will be used as a reserve supply of pulpwood. The tract is located about 30 miles from the firm's Hopewell plant.

Gov. Douglas McKay of Oregon
has been reported to have authorized the use of inmates of the state penitentiary in a reforestation program on the Tillamook Burn. Prisoners are to be housed in forest camps and receive $2 per day.

New Zealand
is planning to tap her 850,000 acres of man-planted forests as a source of pulpwood. The world newsprint shortage and soaring costs have prompted the action. The proposed newsprint output is 110,000 tons a year, of which New Zealand requires 35,000 tons, leaving 75,000 tons for export.

Experimental Forest Dedicated in Maine

The Penobscot Experimental Forest near Bangor was officially dedicated at a program at the University of Maine in June. The 3,800-acre tract was established a year ago by nine New England pulp and paper companies.

The area has been turned over to the U. S. Forest Service under a long-term lease agreement and will be used primarily for experiments in management of spruce-fir forest lands. The newly dedicated tract is to be operated by the Northeastern Forest Experiment Station's Penobscot research center at Bangor in cooperation with the forestry department of the state university.

Edward C. Crafts of the U. S. Forest Service, who accepted the area for the federal government, declared that the forest is unique in the United States and is a practical example of industry and government working together in the field of forest research.

In a message to the Northeastern Forest Research Advisory Council, Eugene H. Clapp, president of the Penobscot Chemical Fibre Co., stated that the experimental forest is "the first instance in the annals of American forestry that a group of wood-using industries have united to purchase a timberland tract for lease to the government to do such work. It is felt by all concerned," he continued, "that this 3,800-acre area is sufficiently large and varied so that participating companies, the federal Forest Service and the general public all will gain by the results obtained."

Sulphur Developments

Allocation of crude sulphur for United States use in July, August and September has been estimated at 1,050,000 long tons. This was announced recently at a meeting of the International Materials Conference in Washington.

Those attending the meeting reported that sulphur allocations for the "free world" are to go into effect immediately. The estimate of domestic use takes into consideration the 250,000 long tons that the U. S. will be required to export during the three-month period.

Total "free world" supply of sulphur is expected to be 1,415,000 long tons for the next three months. Of this total, Britain will get 106,300 tons, Italy 36,000 tons, Australia 31,600, France 31,200. Other nations will get smaller amounts.

Because of the world situation regarding the sulphur supply, domestic users are currently restricted by the National Production Authority to a monthly supply not to exceed the amount used in the average month of 1950. The NPA has estimated that such regulation has slashed consumption 10 per cent from what it was early this year. Currently, NPA officials feel that the order now in effect could be altered to favor those industries, such as steel and rubber, using a great part of all sulphur production.

While warning domestic consumers to cut their use of sulphur because of the increased allocation for export, Freeport Sulphur Co. is now delivering to its customers on the basis of 85 per cent of their purchases for the year ended September 30, 1950. Langbourne M. Williams, Jr., president of Freeport, stated recently that U.S. production of sulphur is more than ample to meet all the nation's domestic requirements and attributed the shortage to unprecedented foreign demands for cheap American brimstone. The export quota set by the government for the second quarter was 250,000 long tons.

Mill to Produce SO_2

Among the first sulphite mills to take positive action to combat the present shortage of sulphur is Brown Co., Berlin, N. H. That firm has completed plans for the immediate installation of a Dorrco FluoSolids System to produce 13 per cent SO_2 from pyrrhotite concentrates containing only 35 per cent sulphur. Capacity will be the equivalent of 9,000 tons of sulphur per year for use in the acid systems. Present plans call for the eventual doubling of the installation.

The installation has been reported to be the first in which relatively low sulphur-content pyrrhotite will be successfully roasted without the use of extraneous heat. In addition, the cost of SO_2 from pyrrhotite is expected to be the equivalent of $24 per ton of sulphur delivered.

Mining Surveys in Canada

As a part of its present program to combat the sulphur shortage, Dominion Tar and Chemical Co., Ltd., Montreal, has completed negotiations with Fortune Oils Ltd. that give Dominion Tar a controlling interest in Sunbeam Sulphur Ltd. of Calgary, Alberta. Exploratory drillings have been approved by the Alberta government.

Two showings of sulphur deposits have been located in an area about 100 miles north of Edmonton, an announcement from Dominion Tar states. While it is too early to determine the value of these deposits, observations have indicated the possibility of sizeable min-

All these Valves .. from One!

Valve combinations for 90% of industrial piping assembled with 4 bodies and a handful of parts.

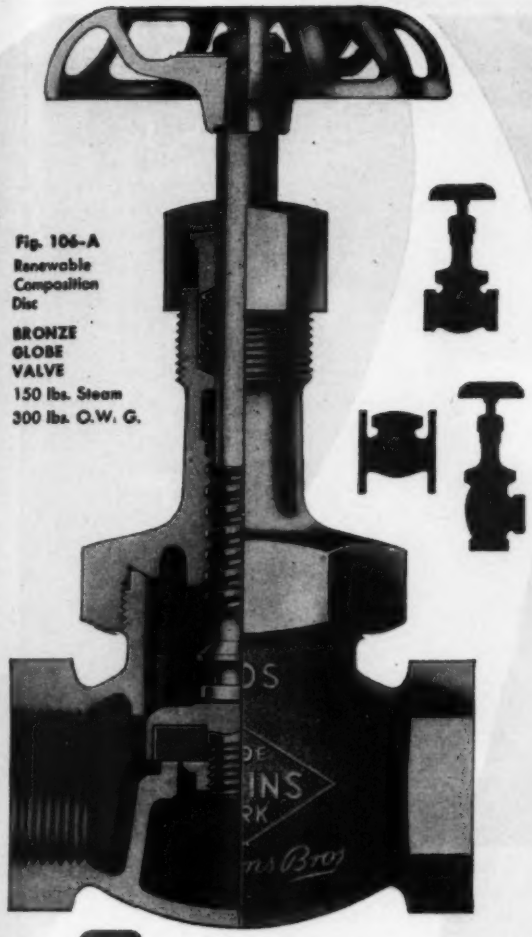
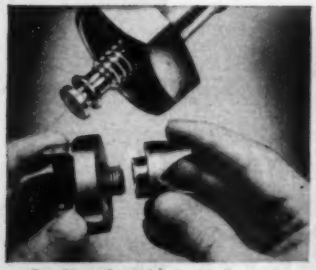


Fig. 106-A
Renewable Composition Disc

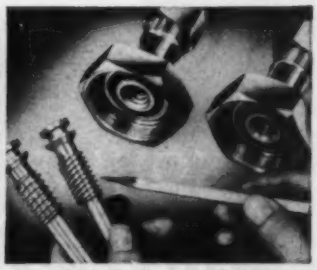
BRONZE GLOBE VALVE
150 lbs. Steam
300 lbs. C.W.G.

JENKINS FIG. 106-A "FAMILY"

Start with the standard Fig. 106-A. Trimming is interchangeable in Globe or Angle body, screwed or flanged.

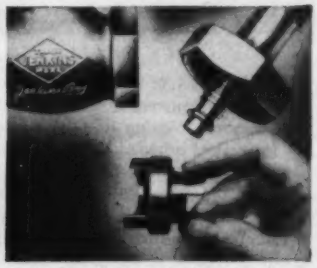


For Close Control — In throttling service, the nut which holds the disc in the disc holder is removed and replaced with Throttling Nut, Fig. 344.



For Quick Opening and Closing — Merely substitute the bonnet and spindle from Fig. 941, in which threads are pitched more sharply.

For Lift Check Service — Globe or Angle Bodies can be fitted with interchangeable Cap, Disc Holder, and Guide Disc Nut from Fig. 117A. Addition of spring from Fig. 655A provides spring loaded service.



For Stop & Check Service — Use the 106A trim, but substitute this spindle from Fig. 630A and replace the regular disc nut with the check valve guide disc nut.

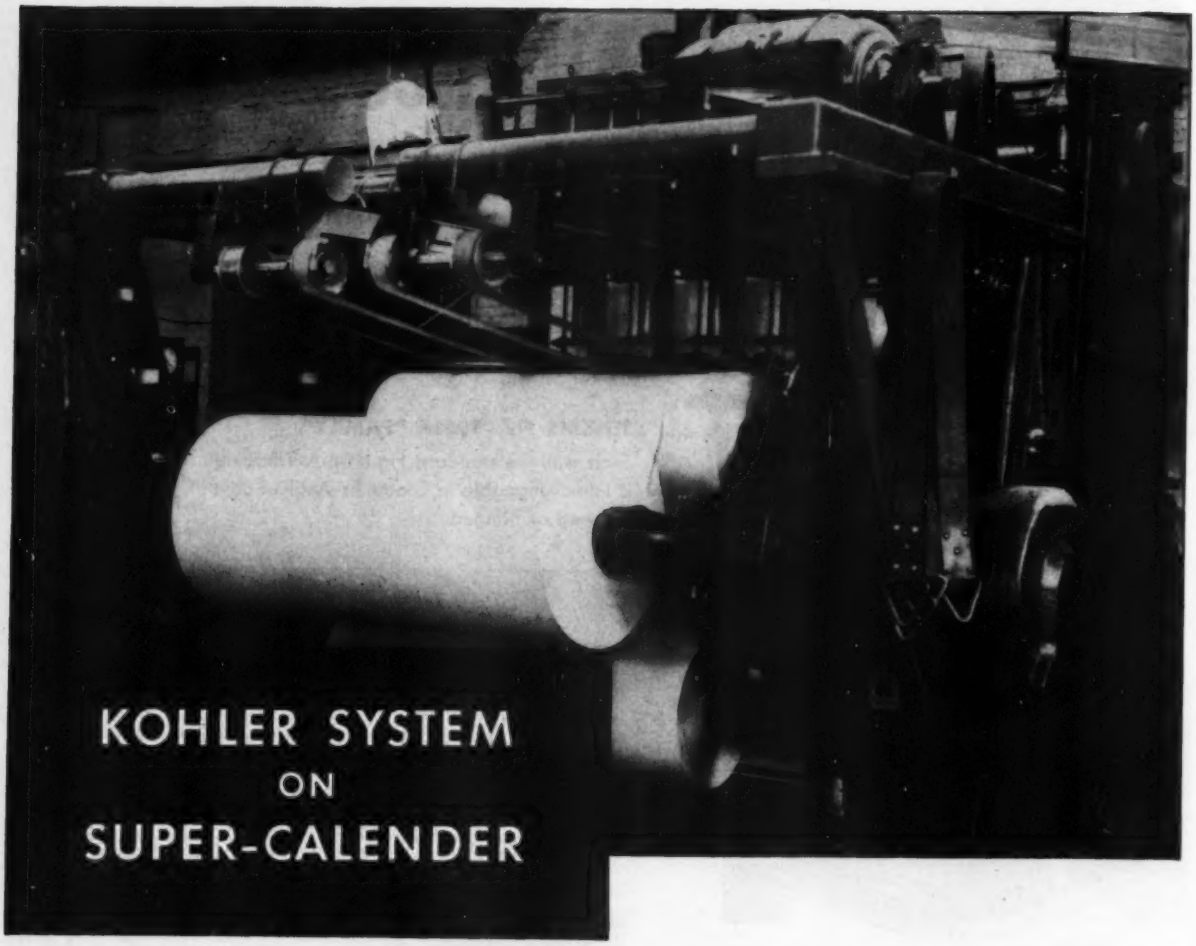
Look over these pictures and see how easy it is to make up just the valve type you need, simply by interchanging parts. Think of the saving this means in maintenance expense . . . in reduced inventory of spare valves in your stockroom.

That's a big reason why the Fig. 106-A series takes top honors in any poll for valve preference. And Jenkins time-proved design, makes them the longest-lasting, lowest-upkeep valves that money can buy.

For example, see the heavy construction of the one-piece, screw-over bonnet. You can remove and replace it over and over again without distortion. See the extra size packing box,—and the perfectly machined threads on the heavy manganese bronze spindle, with more threads in contact with the bonnet, open or closed.

Remember, Jenkins Bros. is the originator of the renewable composition disc valve,—the *only* manufacturer of both valves *and* discs. For drop-tight, trouble-free performance, get acquainted with the Fig. 106-A "family". Despite their extra value, *you pay no more* for Jenkins Valves. Jenkins Bros., 100 Park Ave., New York 17, N. Y. Jenkins Bros., Ltd., Montreal. Sold through leading Industrial Distributors.

JENKINS VALVES



KOHLER SYSTEM ON SUPER-CALENDER

The Kohler System—combination unwinding and winding reel—on a super-calender at a northern coating mill, should arouse the interest of other mills operating super-calenders.

This equipment assures constant uniform tension. It eliminates down time due to loading and unloading. It has brought about a reduction in "snap offs." It has very substantially increased production.

Operating Procedure

The reel unwinds from the upper (rear) position under control of the Kohler running belt tension. The calendered web is rewound on the bottom (rear) position under control of the winder motor mounted above the machine.

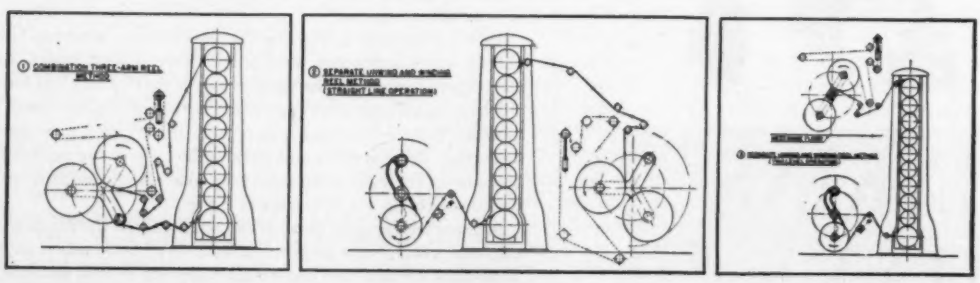
Unloading of calendered rolls and loading of uncalendered rolls take place at the front position by means of an electric hoist and while the stack is running. Roll cores are chucked in ball bearing spindles without the use of shafts.

While the stack is operating, splice is prepared on the fresh roll, which roll is pasted at threading speed to the expiring web. A momentary stop is then made to strike over the winding web to the core of the roll just exhausted. Time—a matter of seconds instead of the several minutes usually required.

Kohler System combination unwinding and winding reels are in service on a number of super-calenders—at paper mills and converting plants.

For more complete data write—

DILTS MACHINE WORKS, Fulton, N.Y.



Division of THE BLACK-CLAWSON COMPANY, Hamilton, Ohio

Western Sales Office: Mayer Bldg., Portland, Oregon

Associate: ALEXANDER FLECK LIMITED, Ottawa, Canada

Subsidiary: B-C INTERNATIONAL, Ltd. 16 Catherine Place, Victoria, London S. W 1., England

eral bodies. If the sulphur exists in commercial quantities and saleable quality the drilling program will be extended.

On the brighter side of the over-all sulphur production picture, Dr. Clyde Williams, director of Battelle Institute, Columbus, Ohio, is optimistic about the future. "Unprecedented demand for sulphur both here and abroad, plus limitations on the major source of supply (native sulphur from the Gulf Coast area), have created the present shortage," Dr. Williams has stated. "Fortunately," however, "already available technological processes make possible increased supplies of this basic industrial material. These processes will enable greater production from up-to-now unexploited sources. In addition, some users may now begin to conserve sulphur that is presently wasted."

Dr. Williams estimates that about 3,000,000 tons of sulphur, other than native Gulf Coast sulphur, could be economically recovered annually by present processes. At least one-half of this amount may come from iron pyrite and the balance from by-product operations of copper, lead, and zinc smelters, and from natural and industrial gases.

Less than one-third of potentially recoverable sulphur was produced in 1950, mainly because the cheap native product has made production from other sources uneconomical. Battelle Institute has developed a process for Noranda Mines Ltd., Canada, that permits recovery of a high percentage of elementary sulphur from pyrite. Sulphur in this form is considerably cheaper to ship than sulphur dioxide or sulphuric acid.

Production in Norway

Production of sulphur in Norway in 1950 was 97,500 metric tons, 16,000 tons more than in 1949 and only slightly less than the early estimate of 100,000 tons. Orkla Metall A/S was in operation throughout the year and accounted for most of the increase. Exports in 1950 totaled 76,000 tons.

Recovery of Elemental Sulphur in Mexico

In April recovery of elemental sulphur began at the plant of Petroleos Mexicanos at Poza Rica; production exceeds 100 metric tons daily. Since the unit is designed for an ultimate capacity of 140 tons, a surplus for export may be available in the latter part of 1951.

European users of sulphur have turned increasingly to the American market since World War II, as it is cheaper as well as purer than the foreign product. Domestic sulphur sells from $21 to $22 per long ton, or about 1 cent a pound, as compared with recent sales of foreign sulphur as high as $120 a ton.

NPA officials have estimated that U. S. sulphur production in 1951 will be "just a hair" above 1950 production. This year, they say, sulphur production might reach 5,200,000 long tons, compared with 5,192,184 last year. One chemical division official has been quoted as saying that it may be necessary to channel all proposed deliveries through NPA for approval and possible cutting before deliveries can be made.

NPA Announces Advisory Committee Membership

The National Production Authority has announced the membership list of the Pulp, Paper, and Paper Board Industry Advisory Committee as follows:

M. C. McDonald, president, Chesapeake Corp. of Virginia, West Point, Va.; H. Lee Rauch, president, Consolidated Paper Co., Monroe, Mich.; W. Irving Osborne, Jr., president, Cornell Wood Products Co., Chicago; R. A. McDonald, executive vice president, Crown Zellerbach Corp., San Francisco; George E. Dyke, president, Robert Gair Co., Inc., New York, N. Y.; Hugo Hanson, president, W. C. Hamilton & Sons, Miquon, Pa.; Cola G. Parker, president, Kimberly-Clark Corp., Neenah, Wis.; Leo E. Croy, executive vice president, Marathon Corp., Rothschild, Wis.; J. D. Zink, vice president, Hammermill Paper Co., Erie, Pa.

Sidney Frohman, president, Hinde & Duch Paper Co., Sandusky, Ohio; H. G. Wintgens, vice president, Hoberg Paper Mills, Inc., Green Bay, Wis.; Aubrey Nicholson, president, Hollingsworth and Voxe Co., East Walpole, Mass.; W. B. Zimmerman, executive vice president, Howard Paper Mills, Inc., Maxwell Paper Co., Inc., Franklin, Ohio; Stuart Kay, International Paper Co., New York, N. Y.; Florence M. Lynch, vice president, Pacific Paperboard Co., Longview, Wash.; Amor Hollingsworth, president, Penobscot Chemical & Fiber Co., Boston; Sydney Ferguson, chairman, Mead Corp., Dayton, Ohio.

D. K. Brown, president, Neenah Paper Co., Neenah, Wis.; Peter S. Paine, president, New York & Pennsylvania Co., Inc., New York, N. Y.; Rex Hovey, executive vice president, Oxford Paper Co., New York, N. Y.; John L. Riegel, president, Riegel Paper Corp., New York, N. Y.; W. J. Dixon, vice president, St. Regis Paper Co., New York, N. Y.; Henry P. Schmidt, president, Schmidt & Ault Paper Co., York, Pa.; R. M. Buckley, Soundview Pulp Co., Everett, Wash., and George Olmstead, Jr., president, S. D. Warren Co., Boston.

NPA Advances Two Paper Executives

John Maloney of the Hoberg Paper Mills, Green Bay, Wis., and Gabriel J. Ticoulat, Crown Zellerbach Corp. executive, have been named to new posts in the National Production Authority.

Mr. Maloney has been made director of the NPA's Pulp, Paper and Board Division succeeding Mr. Ticoulat, who is now deputy director of the Rubber, Chemicals and Forest Products Division, which includes the paper, pulp and board section.

During World War II Mr. Maloney was chief of the Tissue Section of the War Production Board, serving in Washington 37 months.

Mr. Maloney is being succeeded as deputy director by John E. Franzen, now on leave from his office as sales manager for Hammermill Paper Co., Erie, Pa. Mr. Franzen was previously manager of Hammermill's New York sales office.

Howard Smith Paper Mills, Ltd., Beauharnois, Que., has granted its workers pay increases retroactive to May 1. A 14 per cent general increase establishes a new basic rate of $1.14 per hour for male employees, while women receive a 7 per cent increase to set their basic rate at 70 cents an hour. The firm also agreed to absorb 50 per cent of a plan for hospitalization, surgical and weekly indemnity insurance.

Lesavoy Industries Inc. suffered damage estimated at $500,000 in a fire at its Newark, Ohio, mill July 20. A company spokesman reported that the blaze started in a pit where drying paper is stored. Probable cause of the fire was thought to be static electricity.

St. George Pulp and Paper Co., Ltd., St. George, New Brunswick, plans to erect a temporary wood mill to replace the structure recently destroyed by fire, throwing more than 200 employees out of work. The mill will be rebult.

Sherman Paper Stock Co. has reported that its plant in Hamilton, Ohio, suffered damage estimated at $25,000 in a fire of undetermined origin June 22.

Gould Paper Co., Lyons Falls, N. Y., recently sold by Continental Can Co. to the International Basic Economy Corp., New York, and the Cia. T. Janer Comercio e Industria of Rio de Janeiro, has announced that a portion of its future production will go to a group of Brazilian publishers. Liner and specialty papers have been produced by Gould under the ownership of Continental Can. It is reported, however,

that since the Brazilian publishers are now part owners printing papers will be part of the output in the future. Lester J. Smith, Gould plant manager for ten months, will continue in that capacity.

United Board & Carton Elects New Officers

At a special election resulting from a change in corporation stock ownership, William S. Stuhr of Weehawken, N. J., has been named president of United Board and Carton Corp. He succeeds P. M. Loddengaard, who recently announced his resignation from active participation in company affairs.

Morris Kay, New York, N. Y., is the newly elected chairman of the board of directors. Chosen vice president was Paul De Gategno. Additional new board members include Hanns Ditisheim, Tarrytown, N. Y.; Charles Passannante, New York; and Carl K. Blum, Harry Stucker, Herman Tubliz, Chester E. Puco, William Zagarino, Thomas A. Terry, Carlo Corsuti, and Perry Koplik.

Mr. Stuhr has announced that no further changes in company personnel are contmplated. The firm, employer of more than 1,000 persons, operates mills and carton plants in Lockport, Thompson, Victory Mills and Syracuse, N. Y., and in Urbana and Springfield, O.

Gardner Co. Publishes Employee Newspaper

The first edition of *This is Gardner*, monthly publication for employees of Gardner Board and Carton Co., Middletown, Ohio, was distributed July 15. Editor of the newspaper is Ed DeHart, former city hall reporter for the *Zanesville* (Ohio) *Signal*.

The reportorial staff of the four-page house organ consists entirely of employees, with at least one correspondent from each department. Under the general direction of the industrial and public relations division of the firm, *This is Gardner* is to be published on the 15th of each month. R. L. Siegel, head of industrial and public relations, is in charge and will be assisted by D. K. Phillips. The newspaper's name was submitted by Frank Brumley, a salesman. He received $50 for his suggestion.

Import Duties Protested

In a protest recently filed with the United States Custom Court it has been claimed by the importer that wrapping paper containing 10 per cent material other than kraft pulp is dutiable as kraft wrapping at 20 per cent. The paper under question has been classified by Vermont officials as wrapping paper other than kraft at 25 per cent. The announcement was made by Warren B. Bullock, manager of the import committee of the American Paper Industry.

Paper claimed to be duty free as paper stock, held by officials at Malone to be dutiable as paper not specially provided for, was involved in another case filed by importers, as was fabricated paperboard imported at Pittsburgh, claimed to be dutiable as test container board at 10 per cent, but held by officials to be dutiable as a manufacture of paper at 17½ per cent.

Customs officials have classified Vinyl coated paper for shoe inner soles as embossed coated paper at 4½ cents per pound plus 10 per cent, and not as shoe board at 10 percent. Sewer pipe imported at San Francisco, composed of saturated paper, was classified for duty at 17½ per cent as a manufacture of paper. Paperboard imported from Canada, claimed to be dutiable as fibreboard at 5 per cent, has been held to be dutiable as test container board at 10 per cent.

Committee Appointed to Run Maine Foundation

Trustees of the University of Maine, Orono, have approved the appointment of a nine-man executive committee that will be responsible for the operation of the school's Pulp and Paper Foundation.

Chairman of the Committee is J. L. Ober, vice president of the Scott Paper Company, Chester, Pa. Other committee officers include: W. E. Parsons, president of the Keyes Fibre Company, Waterville, Me., and F. A. Soderberg, manager of the Industrial Division, General Dyestuff Corporation, New York, N. Y., vice chairmen, and J. B. Calkin, director of the University's department of industrial cooperation, secretary.

Chairmen of the respective committees who are members of the executive committee are as follows: P. S. Bolton, research and technical director for the Robert Gair Company, Inc., Uncasville, Conn., curriculum committee; R. A. Wilkins, vice president of Bird & Son, Inc., East Walpole, Mass., finance committee; T. G. Mangan, manager of the International Paper Company branch, Livermore Falls, Me., membership committee; Prof. L. C. Jenness, head of the department of chemical engineering at the University of Maine, research committee, and Dr. A. S. Campbell, dean of the College of Technology, University of Maine, scholarship grants committee.

Beloit Opens Portland Office

Beloit Iron Works, Beloit, Wis., announces the opening of a West Coast branch office in Portland, Ore. The branch is located at 1201 Terminal Sales Bldg.

In charge of the new office is Russell A. Goodwillie. He has been associated with Beloit since 1934 in engineering and sales capacities. During the past few years he has concentrated his sales activities in the western states.

Herty Foundation Laboratory

in Savannah, Ga., has been granted $20,000 annually by the authorization of Gov. Herman Talmadge. The laboratory, which has been receiving a yearly $10,000 through the State Forestry Commission, will use the funds for a chemical research program. A chemist will be employed to do research with scrub oak and other hardwoods, to enhance the value of pine pulp, and to find ways of utilizing waste portions of Georgia pine.

APMEW, Inc.,

Glens Falls, N.Y., is building a universal paper pulp mill for demonstration purposes. The demonstration plant is at a site near Glens Falls recently purchased by Adirondack Fibre Corp., Inc., of which Harold D. Wells is president. He is also president of APMEW. Mr. Wells has devoted 18 years to developing and improving machinery and processes for the paper industry. Mr. Wells reports that the machines at the new installation will demonstrate the making of kraft pulp, sulphite pulp, and long mechanical pulp from such raw materials as wood scraps, shavings and other waste materials.

Allied Chemical and Dye Corp.,

is said to be planning the construction of a mercury-cell chlorine-caustic soda unit near the Syracuse, N. Y., plant of the Solvay Process Division. The new plant, costing a reported $10,000,000, will about double the present facilities. The project is to be completed in 18 months to two years.

Glidden Co.

plans a 40 per cent increase in the production of alpha protein at its Chicago plant. The project, costing about $700,000, will be made possible by an addition to the soya division plant.

Pittsburgh Plate Glass Co.

has announced expansion totalling $8,500,000 for its chlorine and caustic soda producing facilities at Natrium, W. Va. This plant is operated by Southern Alkali Corp., a wholly owned subsidiary. The building program includes a new cell building for the production of chlorine and an addition to the caustic soda department.

Flexible Tubing Corp.,

Branford, Conn., has announced two appointments in its technical departments. Leo Martin has been named machine design engineer in charge of the machine development and design laboratory, while James W. Hull was made chief of the chemical laboratory and development section.

H. M. Harper Co.,

Morton Grove, Ill., manufacturer of alloy fastenings, has begun plant expan-

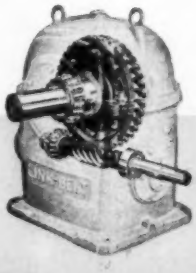
Speed reduction problem?

Is it Ratio? Space? Shock? Overload?

No *one* speed reducer solves *every* reduction problem. That's Why LINK-BELT Builds All 3

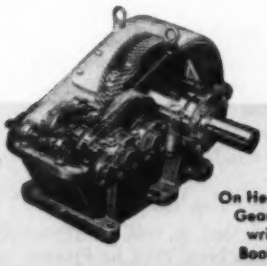
FOR the *right* speed reducer engineered to match your exact conditions, your best bet is Link-Belt. Link-Belt builds all three—Helical, Herringbone and Worm Gear Drives. When a Link-Belt power transmission engineer analyzes your problem, he isn't tempted to fit his recommendation to a limited line.

You can also be sure that the Link-Belt unit recommended is engineered and built for tough operating conditions. And efficiency in power transmission is matched by flexibility in application!

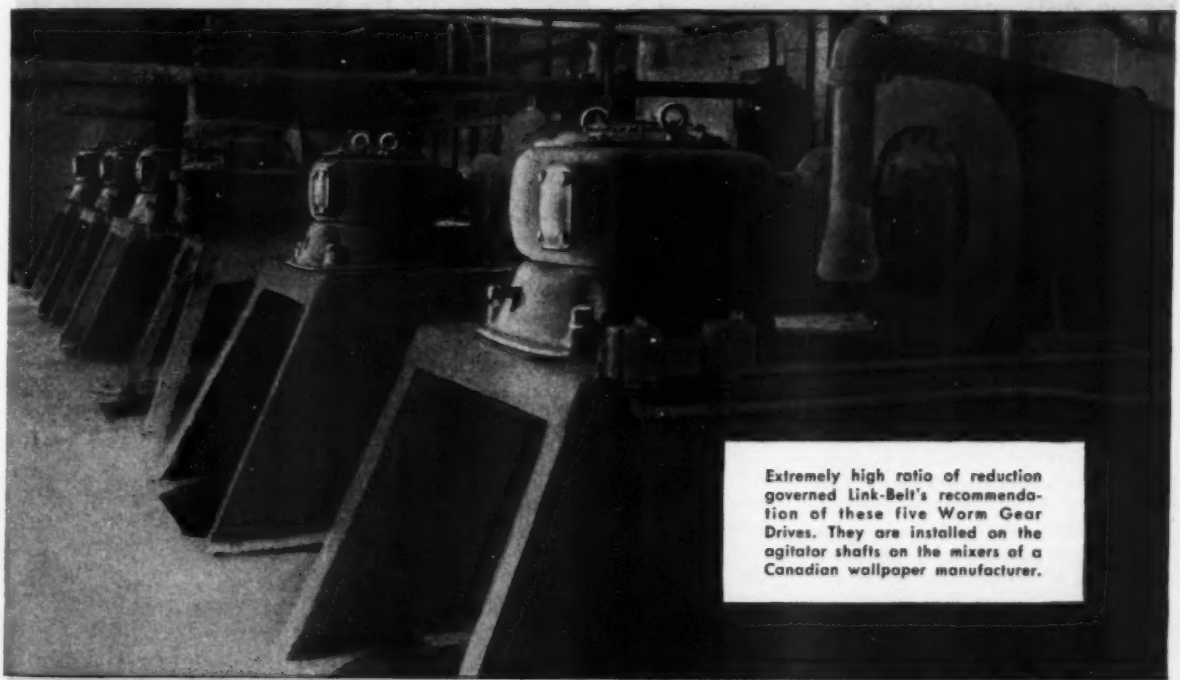


On Worm Gear Drives write for Book 2324

On Gearmotor and Helical Gear Drives write for Book 2247



On Herringbone Gear Drives write for Book 2419



Extremely high ratio of reduction governed Link-Belt's recommendation of these five Worm Gear Drives. They are installed on the agitator shafts on the mixers of a Canadian wallpaper manufacturer.

LINK-BELT
ENCLOSED GEAR DRIVES

12,342

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities.

sion that will increase the total floor space to 166,000 square feet. The new construction is scheduled for completion late this year. The addition will house complete facilities for the reduction of copper, nickel, aluminum, and stainless steel wire, and bar stock.

Insul-Mastic Corp. of America,
Pittsburgh, has named George A. Bulmer manager of its new west coast branch in Los Angeles. The firm manufactures protective coatings for the prevention of corrosion. Formerly associated with the Marine Engineering and Supply Co., Mr. Bulmer is a native of the west coast. He will be in charge of the firm's operations in 11 states.

Fairbanks, Morse & Co.
will manufacture engines and pumps in a new plant to be built near Kansas City, Mo. A foundry will be included in the project.

International Printing Ink Co.,
Cleveland, has opened branch offices in Portland, Ore., and Cleveland. The offices are located at 1525 North West 23rd Ave., Portland, and at 1325 West 73rd St., Cleveland.

Warren Steam Pump Co., Inc.
has announced that it will be represented in up-state New York by Process Industries Engineers, Inc., of Pittsburgh, which has recently opened a branch office in Rochester. J. L. Woll is office manager.

Wheelco Instruments Co.
Chicago, has opened a new district agency for the state of West Virginia at Charleston. The agency, known as the Engineering Products Co., is under the direction of F. E. Anderson and has sales and service facilities for Wheelco products.

Clinton Foods, Inc.,
Clinton, Ia., has announced four executive promotions in its corn processing division. R. P. Jurgensen, general operating superintendent, was named manager of production and will be in charge of all manufacturing operations at Clinton. L. H. Peetz, assistant operating superintendent, was promoted to the post of general operating superintendent. Succeeding Mr. Peetz as assistant operating superintendent is H. C. Heidinger, while Albert Peltzer will take over Mr. Heidinger's duties.

Conoflow Corp.,
Philadelphia, manufacturer of pneumatic control accessory equipment, has extended its field service to embrace territories in Houston, Texas, and Pittsburgh. Representing the firm in the Houston trading area is M. N. Aitken Co., sales engineers for gas, oil and chemical equipment, while Harold G. Jones Co. serves a similar capacity in Pittsburgh, western Pennsylvania and northwestern West Virginia.

Dow Chemical Co.
recently named Richard W. Dornan to handle the sale of coatings materials in the Cleveland territory. Mr. Dornan is a chemical engineer.

Worthington Pump & Machinery Corp.,
Harrison, N. J., has announced the election of A. H. Borchardt as a vice president. He will have overall responsibility for the sale of the firm's entire line of pumping equipment. Mr. Borchardt has been assistant vice president and manager of the Centrifugal Pump Application and Sales Division.

Diamond Alkali Co.,
Cleveland, has announced plans for an expansion project at its silicate of soda plant at Dallas. The program, representing the fourth time in 10 years that the Texas plant has been expanded, is to cost several hundred thousand dollars; it calls for the installation of a large furnace to supplement the production of three smaller type units now in operation.

A. E. Staley Mfg. Co.,
Decatur, Ill., announces the appointment of two senior representatives in the industrial sales department. William G. Dahlquist, formerly with Kraft Foods Co., will be located at the Chicago office, while George H. Kishman of Canton, Ohio, has joined the Cleveland staff. Mr. Kishman was formerly with General Mills, Inc.

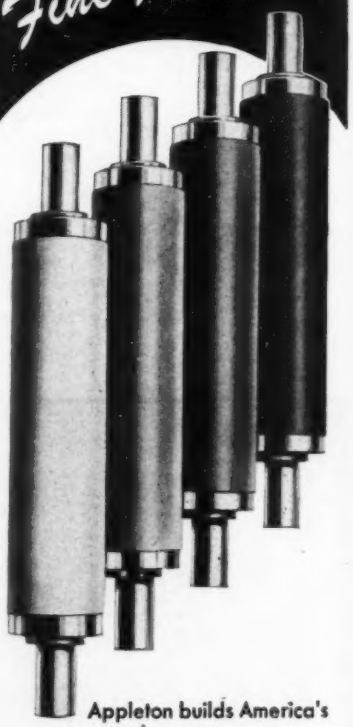
Reeves Pulley Co.,
Columbus, Ind., has expanded its West Coast facilities by the establishment of an assembly plant, together with sales and engineering offices, in San Francisco. A branch has also been opened in Los Angeles. R. G. Sullivan, previously representing Reeves while associated with Western Gear Works, will be in charge.

Merritt-Chapman & Scott Corp.,
New York, N. Y., has appointed Earl C. Smith as sales engineer. An authority in the fields of industrial construction and plant design, he was most recently with Brown & Root, Inc., Houston, Texas.

W. C. Dillon & Co., Inc.,
Forest Park, Ill., has sent its vice president, Robert E. Dillon, on a six-week trip to Europe during which he will discuss various trade problems with company representatives in key cities. He will visit England, France, Belgium, Switzerland, and Italy.

APPLETON SUPER-CALENDER ROLLS . . .

First Choice for Fine Finishes!



Appleton builds America's finest finishing rolls — available in a complete range of sizes and fillings to meet every finishing requirement.

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APPLETON, WISCONSIN
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CASTLE & OVERTON, INC.
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Western Sales Representatives
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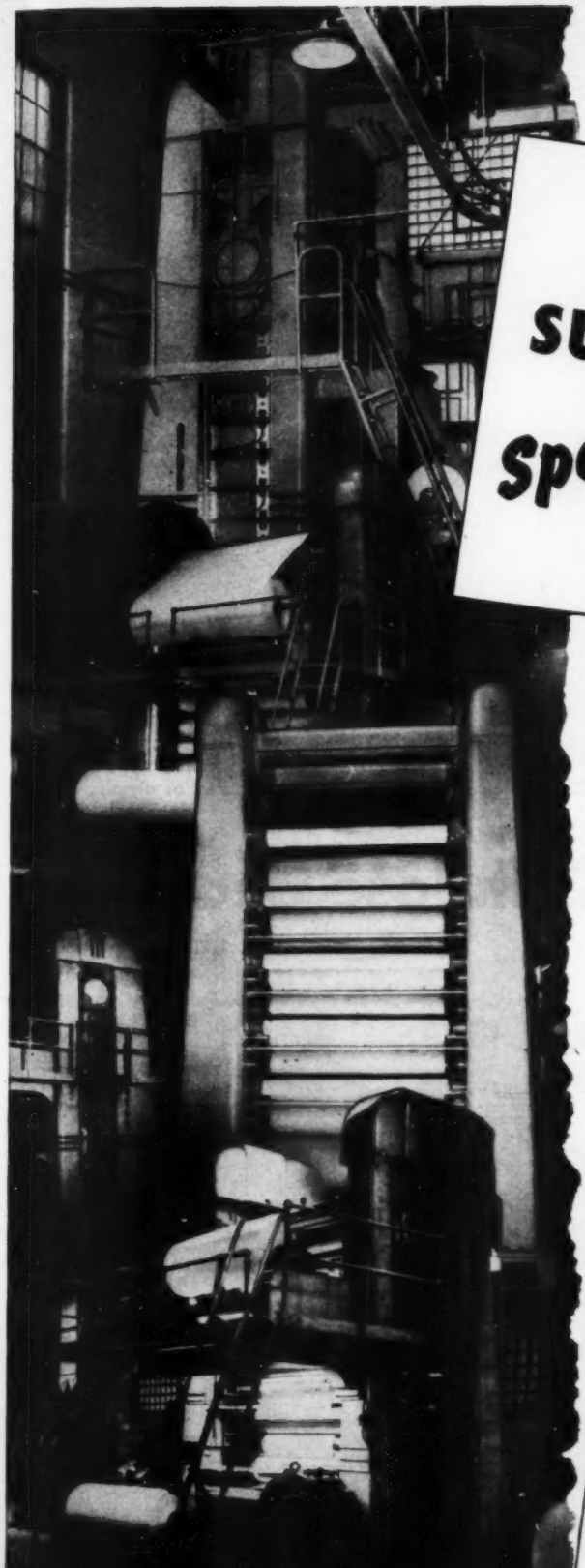
San Francisco • Portland



APPLETON SUPERCALENDERS *speak for themselves*

Yes, modern *Supercalenders* made by the *Appleton Machine Company* speak for themselves. Wherever better paper is being produced, *Appleton Supercalenders* prove they are "America's Finest." Find out about their tested superiority. Write today for technical data on *Appleton Supercalenders!*

Sales	Castle and Overton, Inc., New York
Representatives	Pacific Coast Supply Co., San Francisco and Portland

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CUSTOM-BUILDERS OF PULP & PAPER MILL MACHINES • WINDERS •
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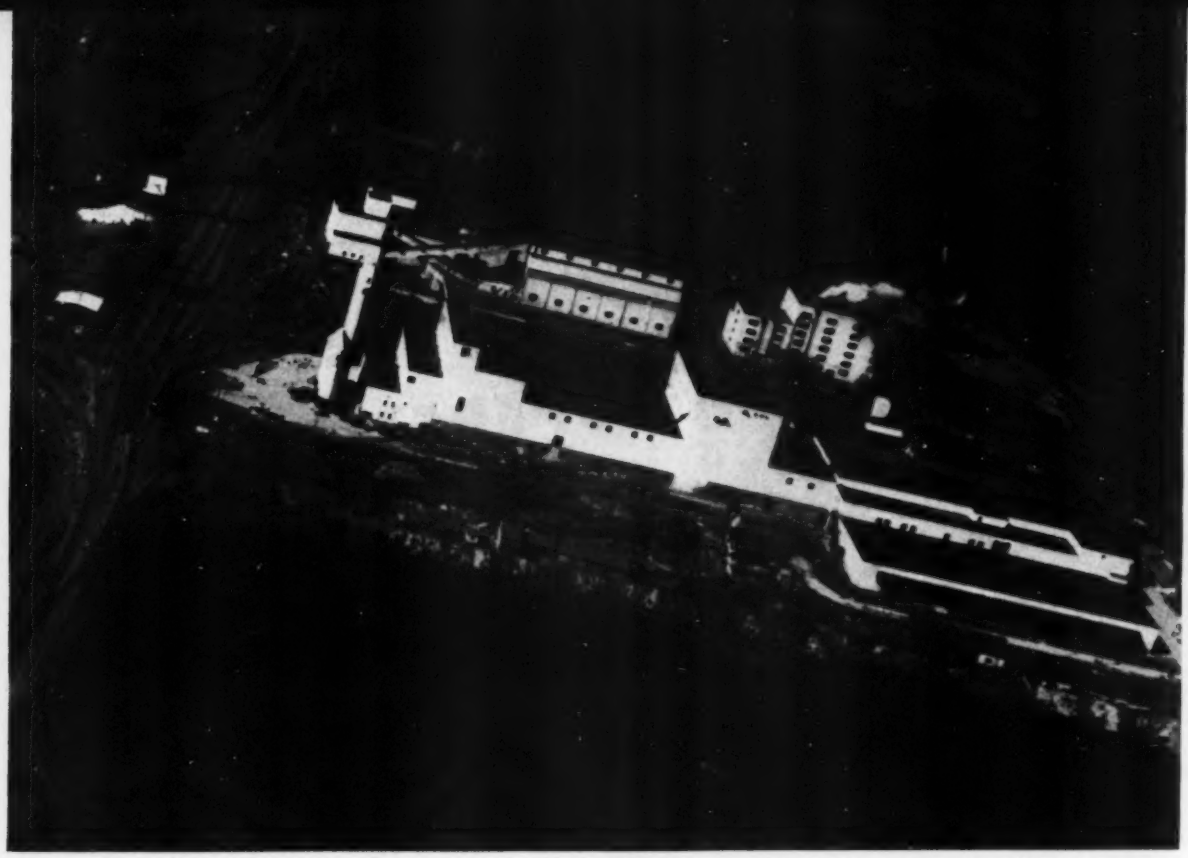
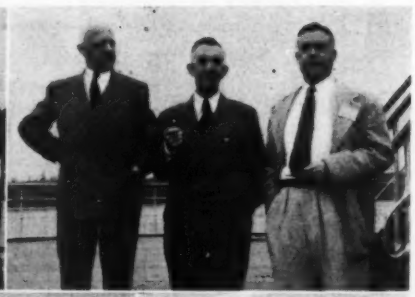
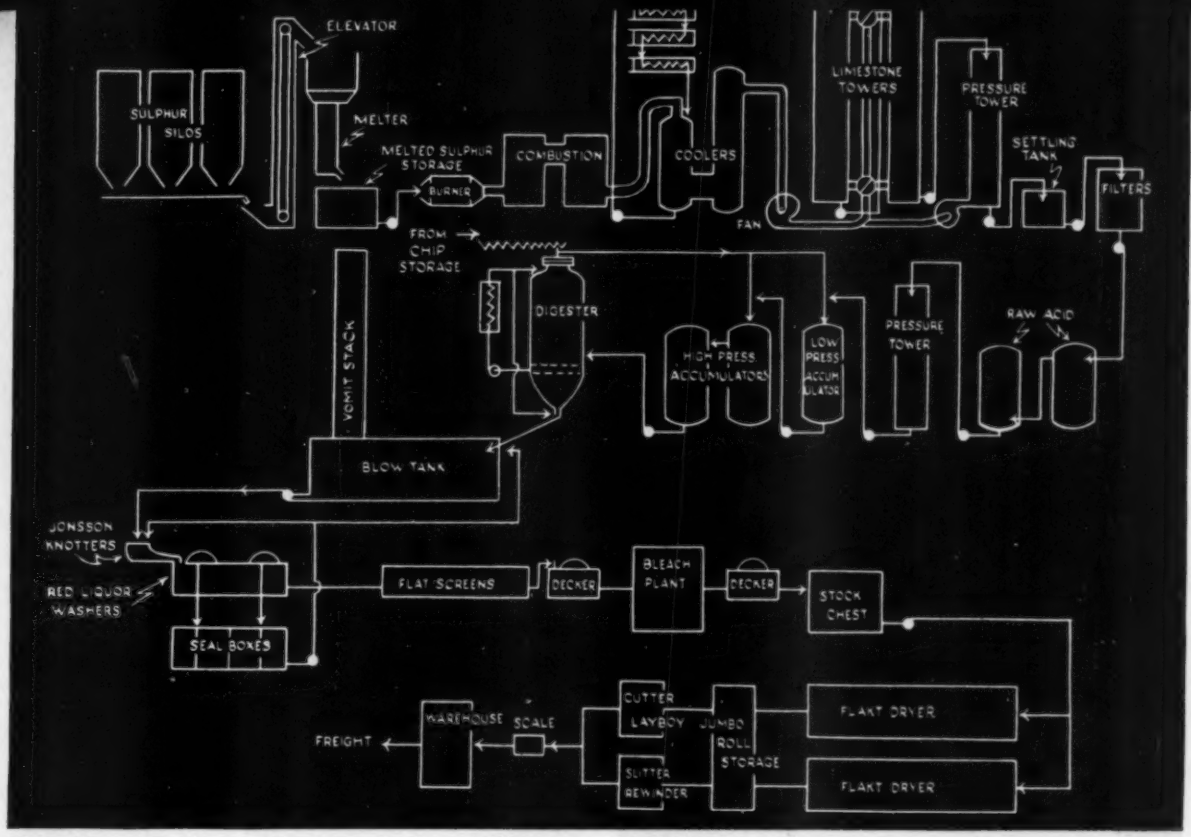


New mill cost $27,000,000, has capacity of 200 tons per day of dissolving pulp

Columbia Cellulose dedicates



Captain Caldwell of the SS Prince George chats with Harold Blanke and Geo. Schneider of Columbia Cellulose on the chartered trip to Prince Rupert to dedicate the new mill. Prominent paper and pulp executives who enjoyed the trip were—top row, Rex Vincent, Bulkley Dunton Pulp Co.; Ray Baker, Weyerhaeuser Timber Co.; Leo Burdon, Soundview Pulp Co.; J. A. Young, Pacific Mills Ltd.; M. J. Foley, Powell River Co. Bottom row, A. H. Natwick, Crown Zellerbach Corp.; John Ashby, Westminster Paper Co.; G. F. Alcorn, Weyerhaeuser Timber Co.; Erik Ekholm and Lawson Turcotte, Puget Sound Pulp & Timber Co.



Flow diagram outlines major steps in the sulphite process for high alpha pulp

new sulphite mill at Prince Rupert

FORMAL DEDICATION of the new Columbia Cellulose Co. dissolving pulp mill at Prince Rupert, B.C., was held on June 12, 1951. To mark this occasion, some 150 businessmen from all parts of the United States and Canada were brought to Prince Rupert as guests aboard the S.S. Prince George (Canadian National's newest luxury liner) from Vancouver, B.C.

Leading participants in the dedication ceremonies were Harold Blanke, president of Columbia Cellulose Co. and its parent company Celanese Corp. of America; Paul E. Cooper, Chairman, Western Branch CPPA and president of Pacific Mills, Ltd.; and Hon. E. T. Kenney, Minister of Canals, and Forests for British Columbia.

The dedication program included a guided tour through the new mill. This article outlines and illustrates the processes and equipment employed in this newest of Canadian industries.

April Startup

It was in April of this year that the new mill actually started. This newest sulphite mill in North America is the first such mill to be built by a synthetic fiber producer and has a rated capacity of 200 tons of high alpha cellulose per day. The pulp will be used in the manufacture of cellulose acetate yarns and plastics.

Object of the new mill was to assure Celanese of an adequate supply of raw material essential to the continued expansion of the company. The $27,000,000 plant covers about 35 acres of the 200 acres of Watson Island. An annual capacity of about 70,000 tons of high alpha cellulose—enough raw material to produce 200,000,000 pounds of acetate yarn and staple fiber—is anticipated for the mill. This annual production will increase by 75 per cent the 1950 supply of dissolving pulp for acetate yarn; total output will be equal to 15 per cent of all dissolving wood pulp used by the rayon industry last year in the United States.

Already Celanese has let contracts for a petrochemical and cellulose acetate flake plant for Edmonton, Alberta. Plans for expanding the new Prince Rupert mill have been talked about. (For further information on Celanese activities in Western Canada, see p. 496.)

Location

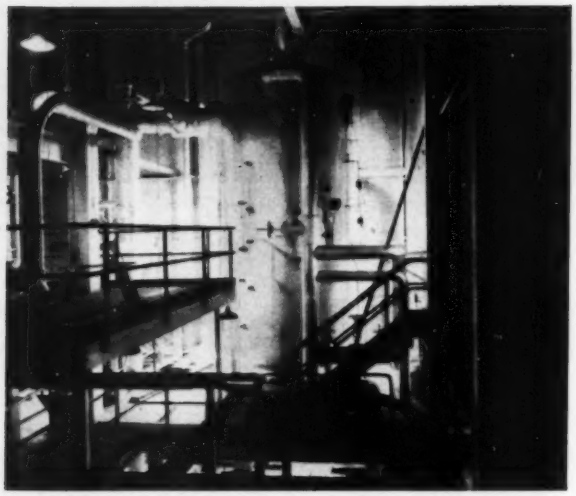
In selecting a mill location in British Columbia numerous factors made Watson Island a logical choice. These include (1) access to extensive stands of suitable timber, (2) fresh water supply, (3) relatively close to sources of coal and limerock, (4) good water and rail transportation facilities, (5) close to established community.

Occupying the site of a former U. S. Army base, the mill on Watson Island is about nine miles from Prince Rupert by rail and thirteen miles by highway. The main line of the Canadian National Railways passes by the mill to its western terminus in Prince Rupert. Prince Rupert is regularly served by several steamship lines including C.P.R., C.N.R. and Union Steamship Co. In addition, Griffiths Steamship Co. now operates a bi-monthly service from Puget Sound to Watson

Lake behind dam supplies fresh water for the mill (note the fish ladder)

Wood stave pipe line (48 in. dia.) takes water 6½ miles to the mill

One of the two Foster-Wheeler power boilers; they burn wood waste and coal



Feedwater deaerator in the boiler room

Island for shipping bulk chemicals. Air transportation is provided by Canadian Pacific Airlines.

One pertinent factor in selecting Watson Island as a mill site was the deep sea wharf built by the U. S. army. The dock, 3,700 feet long and of rough semi-circular shape, is constructed so that it can accommodate deap sea vessels. It carries a double track spur of the railroad line from the shore. Area inside the dock is now a 50 acre mill pond capable of storing 3,000,000 feet of logs.

Mill Layout

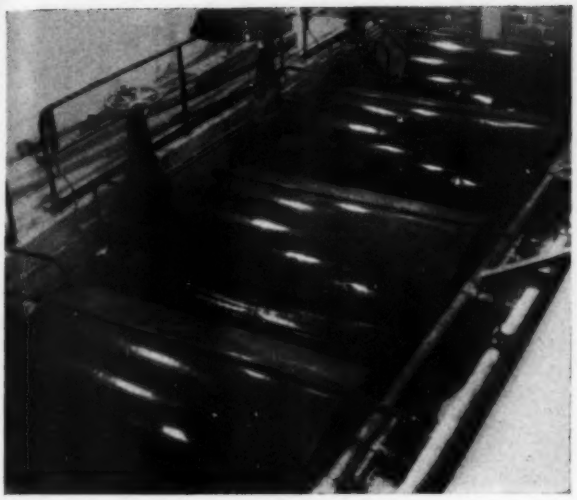
Topography of the site and the fact that it was mostly solid rock suggested that the mill be built on two levels. Although the site had been partially leveled by the U. S. Army, it was necessary to remove about a half million cu. yd. of rock in preparation for mill construction. On the lower area, at an elevation of about 18 ft., are located all operating departments, acid plant, digester room, screen room, bleach plant, pulp drying, finishing, shipping, warehouse and office, together with limestone, sulphur and other chemical storage. On the upper level are located the power plant, wood room, chip storage and coal storage.

Building Construction

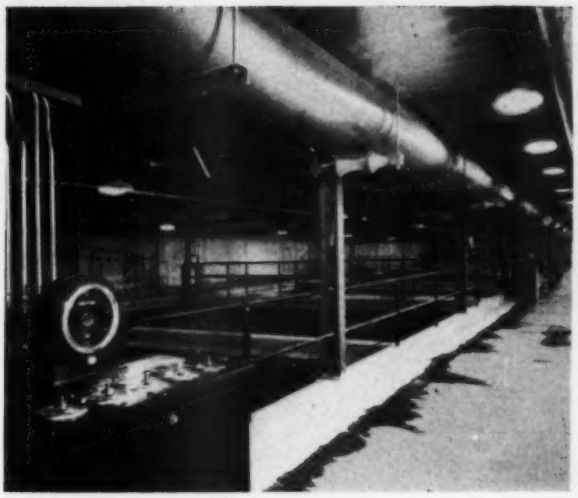
Because the West Coast is subject to earthquake shock, buildings and other structures were designed to resist seismic forces. Most buildings are of steel framework with walls of precast concrete panels consisting of two layers of concrete encasing a two-inch layer of foam glass insulation and tied together with metal channel strips. Fabrication of the panels was handled on the site by Creaghan & Archibald Ltd. of Montreal.

The wall panels are supported on the foundation walls and are fastened to the steel building frame with clamps. Slabs rest on one another with horizontal joints of mortar. Vertical joints are formed by cementing closed-cell foam rubber to the edges of the panels. 3,589 panels were used for 191,800 sq. ft. of wall area. Use of precast panels saved erection time and steel tonnage was lessened by supporting walls on the foundation. Interior walls and secondary buildings were constructed of concrete block fabricated on the site.

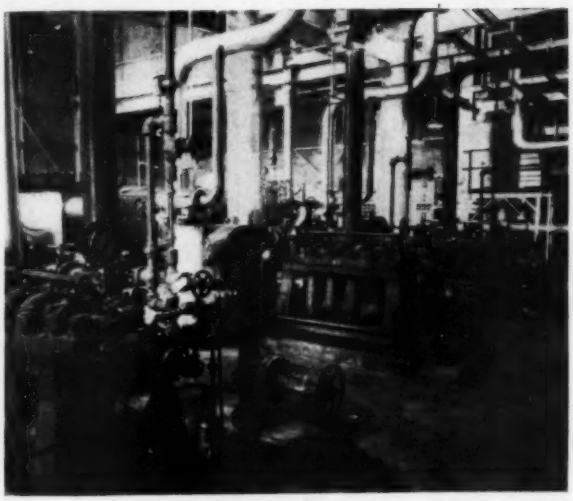
Roofs are level with frequent downspouts for drainage. The roof deck was made of precast concrete slabs of channel shaped cross section. All roofs were finished with builtup roofing.



Fresh water is screened in four North rotary wire-mesh filters



Process water is purified in a Permutit system using flocculator precipitators



Three Allis-Chalmers feedwater pumps; two are turbine driven

Two Worthington 7500 kw. turbogenerators generate at 6900 volts

Wood Supply

Vast quantities of hemlock, spruce and balsam are available in the 1,000 sq. mi. area covered by the forest management license granted the company by the province of British Columbia. Under this license Columbia Cellulose will harvest about 14.5 million cu. ft. of wood per year and will reforest logged off land in order to insure a sustained yield in years to come.

Logging camps have been established at Kutzeymateen Inlet on Portland Canal and at Terrace on the Skeena River. Logs are transported to the mill by rail and by raft. Skeena River logging will soon include river driving operations since the outlet of this river is only about 20 miles from the mill.

Water Supply

Fresh water is obtained from a chain of lakes about 6½ miles from the mill. A 234 ft. concrete dam was built at the outlet of Prudhomme Lake from which a 48-inch wood stave pipe takes water to the mill. The dam, which is about 30 ft. high with a total elevation of 90 ft. above sea level, incorporates a fish ladder to permit spawning salmon to go up stream. Present mill requirements are about 11 million gallons per day but future requirements of up to 37 million gallons per day can probably be obtained from the 24 sq. mi. watershed. Water entering the 48-inch pipe first passes through a Link-Belt traveling screen to remove foreign matter.

At three points along the pipeline route it was necessary to tunnel through solid rock. These tunnels were built oversize to permit them to handle future water requirements of the mill.

Chemical Raw Materials

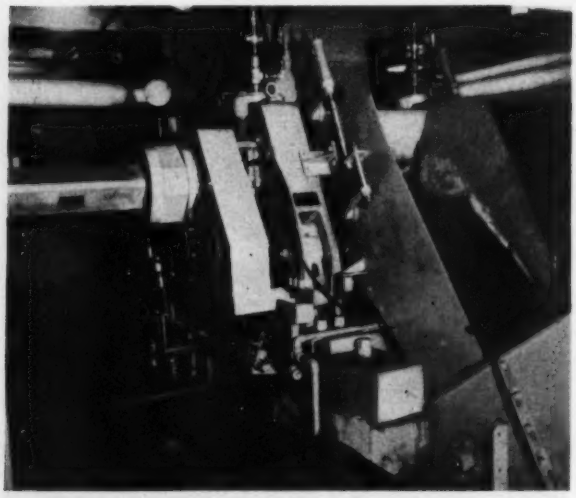
Sulphur is received by ship from the Texas Gulf Sulphur Co. on the Gulf coast. About 10,000 tons per year are used and this is received in about four yearly shipments. Sulphur is unloaded at a rate of about 70 tons per hour into dockside hoppers from which trucks transfer it to the bucket elevator which fills the three silos. Total storage capacity is 3,000 tons. Should the present source of sulphur fail to supply the plant, local sources of pyrites may be considered for sulphur extraction.

Limestone is obtained from quarries on nearby islands. It is transported to the mill dock by barge and is unloaded by a stiff leg derrick with a 4½ cu. yd. orange peel bucket for

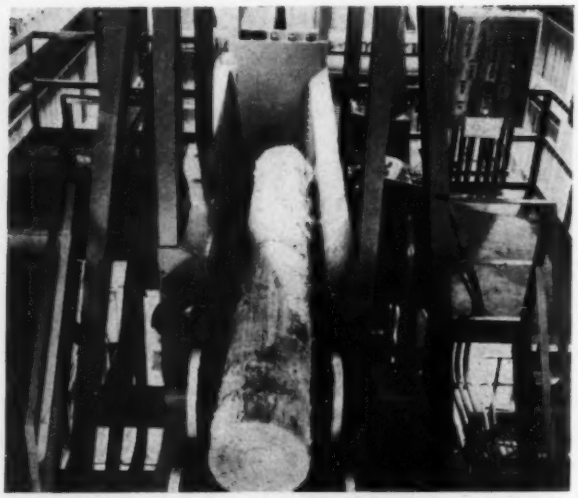
Columbia Cellulose—wood processing

Logs are stored in this 50 acre pond

Saw cuts logs into 20 ft. lengths



Bark is squeezed dry in Squier bark press



Sumner chipper handles 30 inch logs

handling large lumps up to 30 inches in diameter. Trucks transfer the limestone to a concrete slab with a storage capacity of 700 tons. Limestone is transferred by a car scoop from storage to the skip hoist which elevates it to the top of the Jenssen tower.

Chlorine is transported from the Hooker Electrochemical Co. plant in Tacoma, Wash., to the mill by the Griffiths Steamship Co. Employed for this purpose is a converted LST equipped with two deck tanks of 100 ton and 50 ton capacities. Liquid chlorine is pumped by 175 psi. air to the storage tanks ashore without gassification. Chlorine is stored in three 100 ton tanks with two 30 ton tanks adjacent to the bleach plant.

Caustic soda at 50 percent concentration is also supplied by Hooker Electrochemical Co. and it is transported by the Griffiths Steamship Co. in below deck tanks in the converted LST that is used to transport chlorine. Liquid caustic is pumped to the 200,000 gal. storage tanks which are kept at 70 F. From storage the caustic is pumped to the bleach plant in a 2-inch nickel pipe with a steam tracer line.

Water Treating

Raw water at the mill is metered and then screened through four North rotary filters built by Green Bay Foundry and Machine Co. before going to a 300,000 gal. storage well. From here water may be pumped to the hydraulic barker, fire protection system, turbine condenser, cooling system and boiler feed. Process water, however, must be iron free and colorless and is treated in a Permutit water system.

Chemicals for the treatment of water, alum and soda ash, are received in bulk, conveyed to three silos and automatically fed into the mixing flumes ahead of the precipitator. These Permutit flocculator precipitators work on the principle of slow agitation for floc agglomeration and the formation of a sludge blanket in the upgoing passages of the precipitator. Clarified water overflows into a launder which supplies the eight rapid sand filters. Filtrate is collected in the gravel bed by porcelain collectors and is conducted away to the 700,000 gal. clear well from which water is pumped to process by three 6,000 gpm pumps.

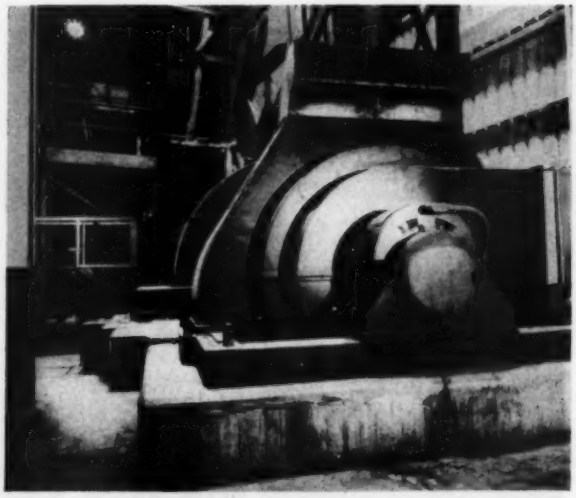
Steam and Power

Coal and wood refuse are used for fuel. Coal from Tekwa, B. C. (about 250 miles from Prince Rupert on the Canadian National) is received in run of mine size and is crushed, screened and conveyed by Jeffrey equipment to either hoppers or outside storage.

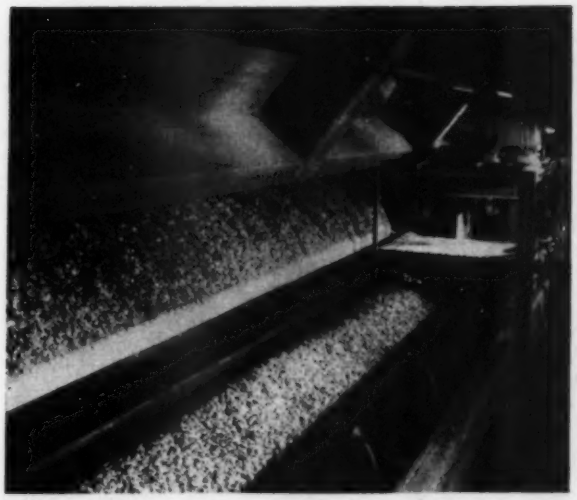
Wet bark and other wood refuse are disintegrated in two Jeffrey hogs and then dewatered by passing through a Squier

Logs entering Bellingham hydraulic barker

Clean debarked logs ready for chipping



Air cooled E-M 1500 hp. chipper motor



W.&W. extractor withdraws chips from bins

bark press. This wood waste with moisture reduced to about 50 percent is delivered to the boiler room by a pneumatic conveyor system through a 17-inch diameter duct. The receiving cyclone is set above a Jeffrey conveyor that feeds the chutes to the furnaces.

Two Foster Wheeler boilers, each with a continuous rating of 180,000 lb. per hour generate steam at 600 psi and 750 F. Coal is fired through spreader stokers and chain grates. Wood refuse is burned in suspension over the main fuel bed. Feed water is handled by three Allis Chalmers pumps, two of which are turbine driven and one motor driven. Ash is conveyed by a Nuveyor pneumatic system to a 100 ton silo from which it is hauled away by truck. Boiler controls were supplied by Bailey Meter Co.

Two Worthington turbine units, both 7,500 kw capacity, generate electricity at 6,900 volts. One turbine is totally extracting at 175 psi. and 75 psi. The other extracts at both pressures and also condenses to exhaust. Pressure reducing stations supply process steam when not provided by the turbines. Power is distributed at 6,900 volts and is stepped down to 550 volts in air-cooled fluidless type transformers.

Wood Processing

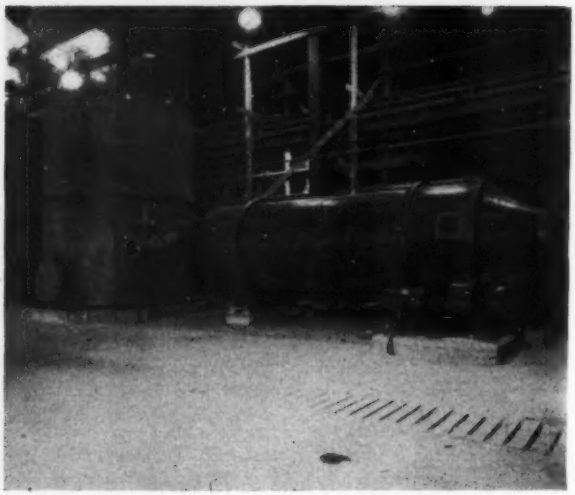
Logs in the 40-acre sorting pond enclosed within the semi-circular dock are fed to the Esco log haul conveyor. Built in two sections, the 460 ft. long conveyor takes the logs over the railroad tracks and roadway to the wood room—about 100 ft. above the level of the pond.

After being cut into 20 ft. lengths the logs go to a Bellingham type hydraulic barker with modified nozzle design. Logs up to 60 in. dia. and 24 ft. long can be handled by this barker. Water at 1,400 psi. is supplied at the rate of 1,000 gpm by Bingham pumps. Barked logs larger than 30 in. dia. are broken down in size by quartering with a Sumner 10 ft. band mill saw using a no-man carriage with electric motor positioned knee blocks. Wood refuse unsuitable for chips is sent to two 48 in. Sumner hogs and is then used for fuel. Throughout the wood mill logs are conveyed on live concave rolls. Most of the heavy wood mill equipment including the roll cases were supplied by Canadian Sumner Iron Works.

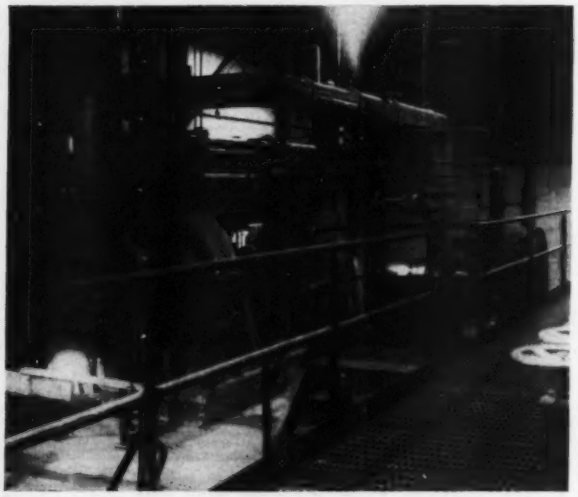
Barked logs up to 30 in. dia. go direct to the 153 in. dia. 6-knife Sumner chipper driven by a 1,500 hp. Electric Machinery Mfg. Co. motor. The whole logs are fed to the chipper by using a hinged apron which minimizes shock as the log hits the chipper disk. Chips are conveyed to a surge bin which feeds five Dillon vibrating chip screens equipped with Sumner feeders. Oversize chips are reduced by a Jeffrey rechipper and accepted chips are conveyed to storage bins.

Columbia Cellulose—acid making, cooking, screening

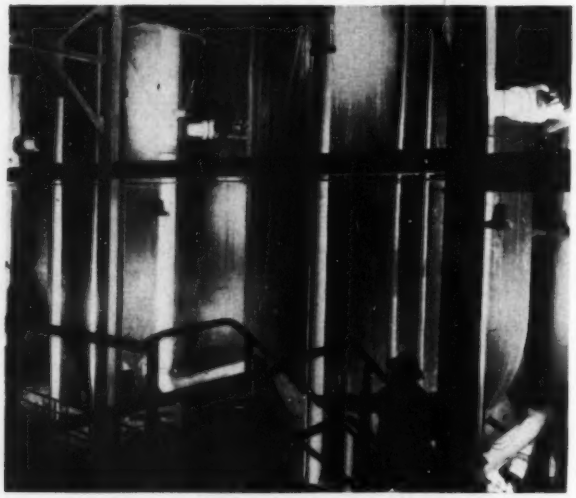
Two Jennsen towers, lime rock storage, sulphur silos with Jeffrey bucket elevators and conveyors



Rotary sulphur burner with two combustion chambers in series, gas goes to Jennsen towers



Gas fan, compressor and water supply tank in the acid plant



Three of the five digesters; Chemipulp hot acid and circulating system is used

Flat screens with Lithcoted flowboxes

Two Sherbrooke deckers for screened stock

Chips are stored in a single large rectangular building 200 ft. long by 60 ft. wide divided by a lengthwise partition and five cross partitions. The twelve bins with hopper bottoms sloping toward the center, discharge onto parallel belt conveyors by means of Williams & Wilson screw extractors, one for each row of bins. The Jeffrey belt conveyors receive the chips and deliver them to the inclined conveyor that takes them to the top of the digester. Each batch of chips is measured on a Keith-Mercer weightometer. Chip delivery to the digester is controlled from the digester floor.

Acid making

Sulphur stored in silos is transferred by conveyer and bucket elevator to an overhead bin that feeds the three vertical tubular melters which in turn discharge to a decanting trough where foreign matter is separated from the molten sulphur. Molten sulphur is held in a brick-lined tank equipped with temperature and level controller. From this tank molten sulphur is pumped to the rotary sulphur burner or vaporizer. Combustion is completed as the gases pass through two chambers in series and is controlled by a Leeds & Northrup SO_2 instrument which regulates the volume of secondary air admitted. SO_2 gas is cooled in a direct spray water cooling system before going to the Jenssen towers.

The two Jenssen towers are 120 ft. high and are equipped with a skip hoist for limestone. The variable speed gas fan to the towers is tied into the control system on the sulphur melter and burner.

Raw acid from the limestone towers is strengthened with burner gas in a pressure absorption tower. After foreign matter and suspended solids are removed in settling tanks and gravity type sand filters the raw acid collects in a clearwell from which it is pumped to two Hortonsphere storage tanks.

G. D. Jenssen Co. designed and built the acid plant. Lining in the acid making equipment were installed by Homad Services Ltd.

Hot acid cooking and recovery

Raw acid is fortified to cooking strength in a conventional Chemipulp hot acid and SO_2 recovery system. Here, raw acid flows counter current to digester relief gas (mainly SO_2) in the accumulator system. Raw acid from storage is first pumped to a pressure recovery tower. Where gas from the low pressure accumulator is absorbed by the liquor which then goes to the low pressure accumulator to be fortified further by cooler gas from the high pressure accumulators. The liquor then is pumped to the high pressure accumulators which receive both top relief (gas) and side relief (liquor) from the digesters.

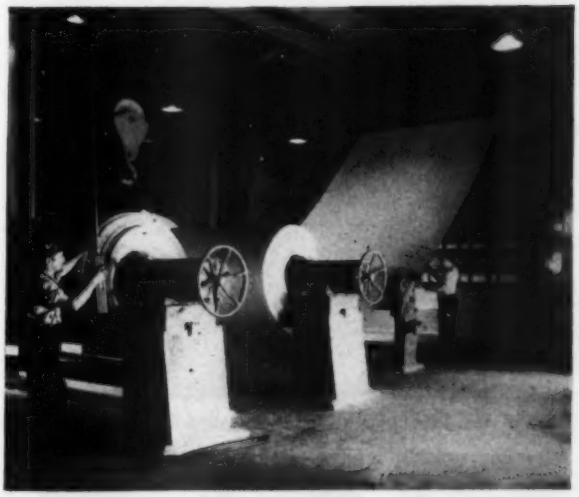
Chips are cooked in five 19 ft. dia. x 59 ft. high 10,000 cf. digesters equipped with Chemipulp circulating systems and external heat exchangers. Liquor is withdrawn from two collector rings, pumped through the heat exchanger and returned to the top and bottom of the digester. Digesters are blown through electrically operated blow valves into any of the three circulation type blow tanks. Here waste liquor is added to dilute the stock to a uniform consistency. A single wood constructed vomit stack serves all blow tanks. Digesters and blow tanks were lined with Stebbins acid proof brick.

Digester operation, from chip conveyor to blow valve, is controlled from a glass enclosed control room adjacent to the operating floor. Actual cooking is controlled by a Foxboro dual tine cam controller on both temperature and pressure operating a control valve on the steam line to the heater and the gas relief valves. Cooking liquor pH is recorded throughout the cook.

Washing and screening

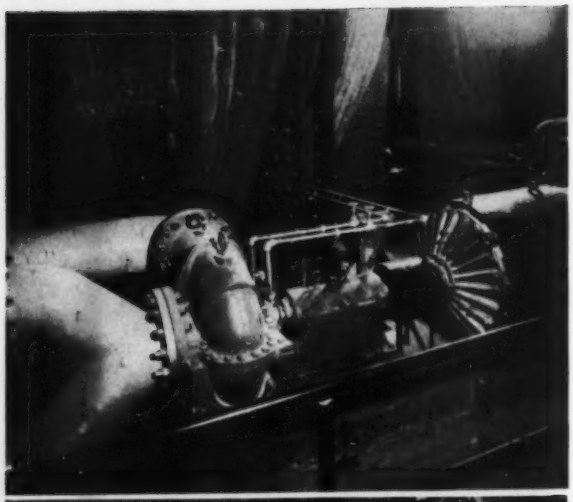
From the blow tanks, cooked pulp is pumped to the headbox feeding three Jonsson knotters and then is washed in two 8 x 16 ft. stainless steel Sherbrooke water vacuum washers

One of the two 136 in. Kamyr wet machines; uses 100 in. dia. cylinder mold



Dry pulp is wound into jumbo rolls as it leaves the Flakt dryer

Sandy Hill rewinder makes rolls for shipment



Two of the 130 Buffalo pumps installed in the mill

Ralph G. Ball

S. B. Roberts

C. H. Klotz

W. C. R. Jones

D. D. Carr-Harris

M. E. Martin

Some of the Celanese and Columbia Cellulose executives responsible for the design, construction and operation of the new mill

set in Stebbins tile vats. Washed stock is pumped through a series of blending chests and is then diluted and sent to be screened on Waterous flat screens. These consist of 26 primary and six tailing screens, each of which comprise 28 plates with Lithcoated vats. Screen rejects and knotter rejects go through a Bauer refiner and are wet lapped for sale.

Screened pulp is thickened before going to the bleaching process which for the most part is a typical sulphite bleach plant. Six 8 x 16 ft. Sherbrooke washers wash the pulp after the bleaching stage.

Pulp drying

Pulp is formed on two 136 inch wide Kamyr wet machines each consisting of a 100-in. dia. cylinder mold, first press, pre-dryers and second press. The pulp sheet is carried through the presses on wet felts. Each wet end is followed by Flakt dryers and a reel for making jumbo rolls. The Kamyr Flakt machines were supplied by Paper Machinery Ltd. Broke from the dry end of the machines and from finishing operations is repulped in two APMEW pulpers and screened in two APMEW centrifugal pulp screens.

Jumbo rolls of pulp are stored until they have been tested and classified to be sure quality is up to the high standard necessary for the acetate yarn process.

Finishing

Pulp is shipped from the mill in either rolls or bales. When shipped in rolls it is rewound in smaller rolls on a Sandy Hill slitter and rewinder. When pulp is baled it is cut into sheets on a Lamb-Grays Harbor automatic cutter layboy, weighed and baled in an Hydraulic Machinery Co. hydraulic baling press. Mathews conveyors are used to transport both rolls and bales to storage. Here Clark fork lift trucks transport the pulp to cars for shipment or to the warehouse.

Heating and ventilating throughout the plant are handled by Buffalo fans and unit heaters (Canada Forge & Blower Co.). Nearly 100 fans from 1,300 to 68,000 cfm. are installed.

Over 130 Buffalo pumps (supplied by Canada Pumps, Ltd.), ranging in size from 1 to 14 inches, handle practically all types of applications including water, molten sulphur, circulating acid in the digesters, and stock up to 6½ per cent consistency. Stock pumps are diagonally split with closed impellers.

Process instrumentation and controls were supplied mainly by Foxboro (Peacock Bros.) while boiler controls were furnished mainly by Bailey Meter Co.

Engineering and Operating Personnel

Building activities started in 1947. Coordinator for the project was Dr. R. G. Ball, now general manager of Columbia Cellulose. Engineering, design and construction was under the supervision of the company's central engineering department directed by S. B. Roberts, chief engineer, and supervised and coordinated by H. M. Wilgus and B. Sola. C. H. Klotz was project engineer at Watson Island and J. W. Macri was construction superintendent.

R. S. Baker was principal consultant until his death in January, 1950. Consultant throughout the whole period of organization and construction was D. G. Stenstrom, formerly with Pacific Mills, Ltd., at Ocean Falls, B.C. Other consulting firms utilized on the project were Stadler-Hurter & Co., and Surveyor, Nenniger & Chenvert, both of Montreal; and W. H. Rambo, Portland, Oregon.

Management personnel at the mill include the following: W. C. R. Jones, mill manager; R. O. Evans, production supt.; M. E. Martin, technical supervisor; D. L. Sherk, chief chemist; D. D. Carr-Harris, plant engineer; Eugene Bartlett, asst. plant engineer; G. R. Morrison, chief power engineer; L. O. Loucks, chief electrician; G. Selvig, woodroom foreman; C. S. Foreman, purchasing agent; D. J. Doswell, personnel super-

visor; L. E. Cuthbertson, controller; R. L. Johnson, mgr. woods dept.

Effects of the opening of the mill have already been felt at Prince Rupert; for the first time in its history it has almost a guarantee of prosperity. After the U. S. Army left the town in 1946, population had dropped to 7,500 from about 27,000 in 1945. The influx of Celanese Corporation workers—and the use of local labor—will undoubtedly place the town on a more prosperous basis. Then, too, production on Watson Island will certainly influence other sections of Canada; ultimately, much of the Cellulose produced will not be exported as pulp, but will be processed into manufactured items in the Dominion. Soon, some pulp from Watson Island will furnish working material for a plant now being planned for Edmonton, Alb., by another Celanese affiliate, Canadian Chemical Co. Ltd.

Process equipment

Hot Acid System—Chemipulp Process, Inc.; *Raw Acid System*—G. D. Jenssen Co.; *Chest Agitators*—William Kennedy & Sons; *Raw Acid Tanks*—Horton Steel Works; *Acid Accumulators*—Horton Steel Works; *Ash Disposal System*—Nuveyor Corp. *Hydraulic Barker*—Sumner Iron Works; *Bark Press*—Geo. L. Squier Co.; *Boilers*—Foster Wheeler Co.; *Barker Pump*—Bingham Pump Co.; *Pneumatic Bark Conveyor*—Day Co.

Conveyors, chip, wood refuse, coal, chemicals, pulp, etc.—Jeffrey Mfg. Co.; *Conveyors, pulp*—Matthew Conveyor Co.; *Consistency Regulators*—Askania Co.; *Compressor*—Can. Ingersoll Rand; *Digester Circulating System*—Chemipulp Process, Inc.; *Deckers*—Sherbrooke Machinery; *Pulp Drying Machine*—Paper Machinery Ltd.; *Digester Blow Valves*—Emmans Lt.

Electric Motors—English Electric Co.; *Chipper Motor*—Electric Machinery Mfg. Co.; *Barker Pump Motor*—Electric Machinery Mfg. Co.; *Feed Water Pumps*—Can. Allis Chalmers; *Fans and Blowers*—Canada Forge & Blower Co., Buffalo Forge Co.; *Handling Equipment, Dry pulp*—Can. Vickers Ltd.,Sandy Hills Iron & Brass Works, Lamb-Grays Harbor Co., Matthews Conveyor Co.; *Instruments*—Bailey Meter Co.; Foxboro (Peacock Bros.), Leeds & Northrup Co., Minneapolis Honeywell Reg. Co., Ind. Div.; *Insulation, Pipe*—Drexel Co.

Jonsson Knotters—Can. Ingersoll Rand; *Linings in Chests and Digesters*—Can. Stebbins Co., Homad Services Ltd.; *Log Haul, Drive*—United Steel Corp.; *Log Haul, Castings*—Esco Ltd.; *Pumps,* stock, water, chemical, etc.—Canada Pumps Ltd. (Buffalo Pumps, Inc.); *Pulp Press*—Hydraulic Machinery Co.; *Woodstave Pipe*—Can. Wood Pipe & Tank Co.; *Pipe, Stainless Steel*—Shawinigan Chemicals; *Pipe, Cast Iron*—Canada Iron Foundries; *Pipe, Power Plant*—Crane Ltd.; *Pipe, Lithcoted Lined*—R. F. Walsh Co.; *Pipe, Rubber Lined*—B. F. Goodrich Co.; *Pipe, Hangers*—Grinnell Co.; *Pipe, Hangers,* Piping Specialties, Inc.; *Pipe, Vitrified Tile Sewer*—Robinson Clay Products; *Paint*—Canadian Industries Ltd., Pittsburgh Plate Glass, Quigley Co.

Refiners—Bauer Bros.; *Rechipper*—Jeffrey Mfg. Co.; *Chip Screens*—Thomas D. Dillon, Ltd.; *Flat Screens*—Watrous Ltd.; *Rotary Pulp Screens*—Paper Mill Equipment Ltd.; *Main Switch Gear*—Canadian General Electric Co.; *United Sub-Stations*—Westinghouse Electric Co.; *Scales*—Toledo, Fairbanks Morse; *Trucks, Lift*—Clark Equip. Co.; *Turbo Generators*—Worthington Pump & Machinery Co.; *Trucks*—International Harvester Co.; *Vacuum Pumps*—Nash Eng. Co.

Wood Room Equipment—Sumner Iron Works; *Chip Weightometers*—Keith Mercer Co. (Builders Providence Inc.); *Washers*—Sherbrooke Mach. Ltd.; *Bleach Plant Washer*—Sherbrooke Machinery; *Water Treating Plant*—Permutit Co.; *Water Screens*—Green Bay Foundry & Machine Co.; *Elevated Water Tank*—Horton Steel Works; *Wet Machine*—Port Arthur Shipbuilding. *Kamyr Wet Machines*—Paper Machinery Ltd.

Facts about Celanese Corp. of America

Products

Celanese and its subsidiaries manufacture a wide variety of products including cellulose, cellulose compounds, cellulose acetate yarns and fabrics, plastics, synthetic polymers and industrial chemicals. The company, first to make cellulose acetate yarn in 1925, produces more than half of all the acetate yarn made in the U. S. today and has pioneered in developing the use of acetate fiber in the garment industry, carpet industry and others.

Plants

Home office of the company is at 180 Madison Ave., New York. Plants in the U. S. are located at Cumberland, Md.; Belvedere, N. J.; Bridgewater, Va.; Burlington, N. C.; Narrows, Va.; Rock Hill, S. C.; Hopewell, Va.; Newark, N. J.; Rome, Ga.; Staunton, Va.; Williamsburg, Pa.; and Bishop, Texas. At Bishop, Texas, is located the company's petrochemical plant where acetic acid, acetaldehyde, formaldehyde and methanol are made from natural gas.

Two plants carry out plastic-producing activities. The Newark, N. J., unit (original headquarters of Celanese) produces films and foils of cellulosic plastic materials. At Belvidere, N. J., cellulosic plastic molding materials are manufactured. A central research laboratory is maintained at Summit, N. J., for the study of products and the development of methods, processes and equipment. Another laboratory is set up at Clarkwood, Texas, to do petroleum chemical research.

International subsidiaries

The new Prince Rupert mill has four predecessor subsidiaries. Celanese Mexicana, S. A., owned jointly with Mexican interests, produces both acetate filament yarn and acetate staple fiber. Viscosa Mexicana, also owned jointly with Mexican financiers, produces viscose filament yarn and staple yarn. Together with Colombian interests, Celanese has formed Celanese Colombiana, S. A.; this firm is now erecting a cellulose acetate yarn plant near Cali, Colombia. Another new subsidiary, Celanese Venezolana, S. A., has been organized to erect a yarn plant in Venezuela. Canadian Cremical Co. Ltd. was formed for the purpose of constructing a petrochemical and cellulose acetate flake plant near Edmonton, Alberta, Canada.

Directors and officers

Dr. Camille Dreyfus, one of the founders of Celanese Corp., is chairman of a board of directors which includes Sir William Alexander, Aldo R. Balsam, Charles F. Beran, Harold Blancke, Peter D. Cooper, Charles C. Parlin, George H. Richards, George Schneider and Fred T. Small.

Mr. Blancke is president of the parent company; Mr. Richards is its vice president and treasurer; Mr. Beran, Mr. Cooper, Mr. Small and Harry Price serve as vice presidents; Mr. Schneider is senior vice president; Ronald O. Gilbert is secretary; and Arthur R. Janes is controller.

Staff officers include E. R. Allan, V. P., industrial relations; E. N. Cleaves, V. P., public relations; John P. Holms, V. P., warpknit fabrics; W. Stuart Landes, V. P., plastics; H. E. Martin, V. P., cellulose acetate; and H. C. Van Brederode, V. P., woven fabrics.

Financial

In 1925, the company's first full year of operation, less than $2,000,000 worth of products were sold. By 1944 sales reached more than $100,000,000; in 1948 that figure was more than doubled, for sales totaled well over $200,000,000. In 1950, over $232,000,000 worth of Celanese products reached consumers.

Slightly more than two thirds of Celanese preferred stock, and more than one third of its common stock, is owned by institutions (churches, colleges, trust companies, insurance firms, investment trusts, and estates); stockholders totaled 34,949 at the end of 1950.

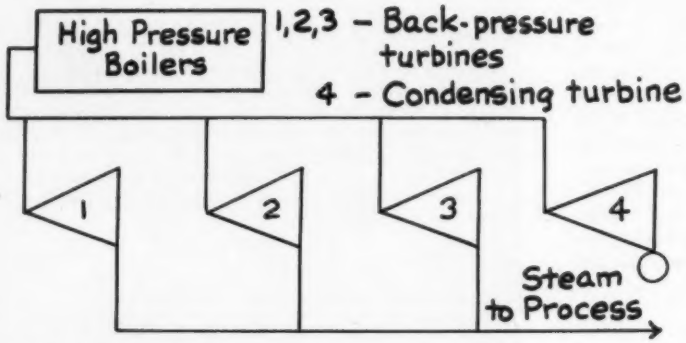
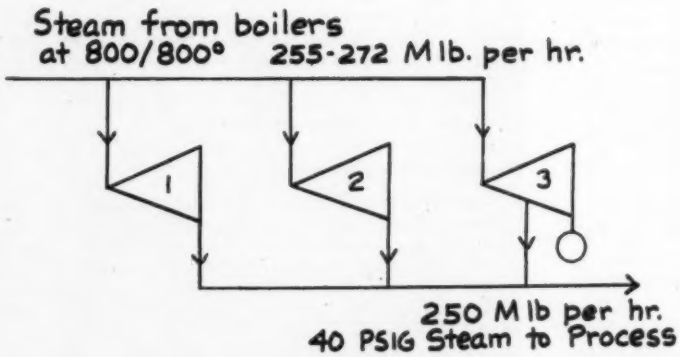


Fig. 1—Condensing turbine unit carries excess power load



TG	1	2	3
Type	str. b.p.	str. b.p.	sing. extr. cond.
Cap. of TG	5000 KW	5000 KW	5000 KW
CONDITION I – Tot. KW Gen. – 13000 KW			
KW Gen.	5000	5000	3000
St. Flow to TG *	93	93	69
Extr. Flow	0	0	64
Cond. Flow	0	0	5
CONDITION II – Tot. KW Gen. – 15000 KW			
KW Gen.	5000	5000	5000
St. Flow to TG	93	93	86
Extr. Flow	0	0	64
Cond. Flow	0	0	22

* All Flows are in M lbs pr. hr.

Fig. 2—Two back pressure turbines with an extraction-condensing unit produce a good heat balance

Paper Mill Power—
Part IV

Three ways to

DAVID MOFFAT MYERS
Myers & Addington, New York

BALANCING steam and power demand is necessary for efficient operation. Let us assume now that the suitable throttle pressure and temperature have been determined by the method shown in parts I and II published in THE PAPER INDUSTRY in May and June, 1951. In an actual power analysis, all steam and power demands, such as those of auxiliaries and feedwater and space heating, are included for a complete heat balance. The present treatment is simplified for clarity in discussing the principles involved. We will have, as previously stated, frequent swings in power and steam demands. Some of these will occasion a call for a little more electrical energy than can be derived as by-product from the process steam.

Such demands could be met simply by increasing the load on the turbine to produce this extra power. The relief valve would then open and the added turbine steam would be exhausted out of doors at the prevailing process—or back-pressure.

This would be wasteful because for each KWH thus generated, there would pass to the atmosphere some 20 to 40 lb. of steam per KWH (These figures will vary with throttle and back pressures and size and efficiency of the turbine-generator). Now if on the other hand, this increment of power could be generated by a condensing turbine or its equivalent, the consumption of steam would be in the order of only 10 to 13 lb., the exact figures depending on steam and load conditions.

More process steam required

Some of the swings may call for more process steam than the turbine will pass. In this event, direct boiler steam is automatically admitted to the process main through a pressure-reducing and desuperheating station. When operating in this way, the plant is at top efficiency. This is so because all the power is generated as a by-product of process steam and there is virtually no heat loss in the pressure-reducing station.

The first condition described, which occurs when a little more power is needed than that which is produced as by-product of the process steam, requires

handle variations in steam and power demand

careful study of heat balances to develop a plant of maximum economy and efficiency.

For the sake of simplicity, we will first consider a mill that requires only a single process steam pressure. The power problem of a plant requiring more than one process pressure level will be later discussed.

Condensing turbine carries extra power load

In a plant requiring several power units, one solution is to carry the main load on back-pressure turbines exhausting to process to supply average requirements. Add a straight condensing turbine unit to carry a small electric load plus excess power demands as they occur. In this way such power swings are met economically.

A gauge on the general efficiency of such a plant is the degree to which the steam to the condenser can be kept to a minimum. A well-designed plant may show steam to the condenser around 5 to 10 per cent of the total steam generated. Such a plant is illustrated by the diagram in Fig. 1.

Extraction condensing turbine aids efficiency

Another solution of the same problem would employ the principle of the automatic extraction condensing turbine-generator, which combines the functions of both back-pressure and condensing units in one. Thus a condensing machine is designed to bleed or extract steam at process level, the balance of the steam needed for generating the additional power load being expanded through further power blading to the condenser, which thus provides an automatic heat balance either in itself or in combination with other turbine units.

The extracted steam is bled from between suitable stages of the turbine by means of an automatic valve after it has done its quota of work in the earlier stages.

The performance chart of such an automatic single extraction condensing unit is shown in Fig. 3. Thus, with this particular turbine, as much as 100,000 lb. of 40 psig. steam per hour can be extracted at 5000 kw. rating, while at 3000 kw., the extraction capacity is 67,000 lb. Its versatility is evident in its

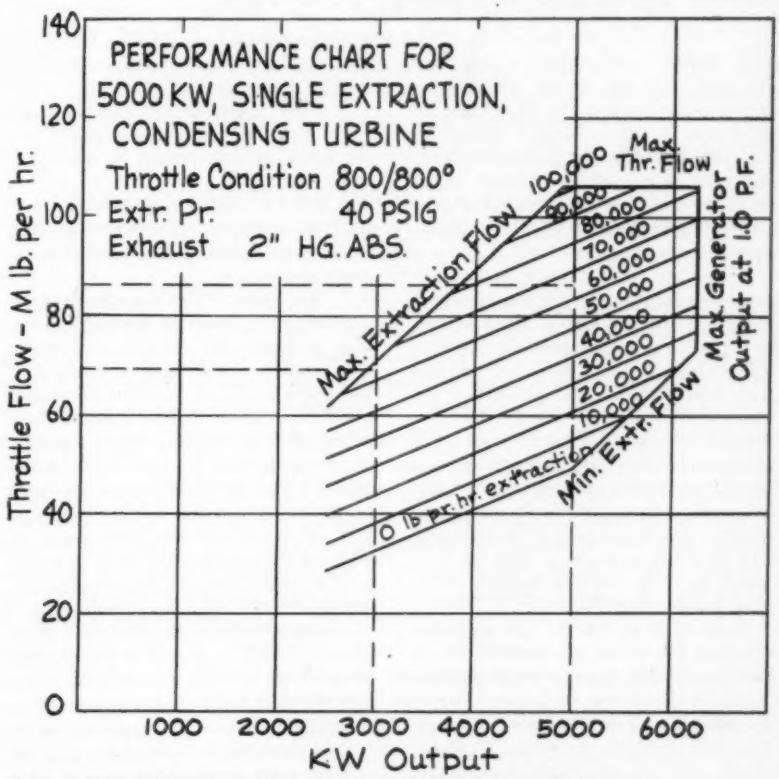


Fig. 3—Chart shows versatility of extraction-condensing turbine

ability to deliver 6000 kw. if required with a minimum of 19,000 lb. extraction or to generate 5000 kw. straight condensing with the excellent steam rate of less than 10 lb. per kwh.

This unit is shown in Fig. 2 combined with two straight back-pressure turbine units to produce a very good heat balance in a paper mill with an average 40 lb. steam demand of 250,000 lb. per hour and a power load verying from an average of 13,000 kw. to a maximum of 15,000 kw.

Economic heat balance achieved

As shown in the steam balance table, when a swing of 2000 kw. over the average occurs with no more steam required by process, the extraction turbine economically supplies this added power load. The steam to its condenser increases from 5,000 to 22,000 lb. per hr., the latter figure being only 8.1 per cent of total steam to the system, while at the average power load it is less than 2 per cent.

It should be noted that while 5000 kw. turbine units are used for illustration, the same principles apply to smaller, as well as larger units, with which comparative results are obtainable.

The average ratio of hourly process steam to power demand in the above example is 250,000/13,000=19.2 lb. per kw. From this ratio, as explained in a previous article in this series, the correct throttle-steam pressure and temperature were determined to provide this very economical heat balance and cheap by-product power.

If the steam power ratio were larger than in the above example or process pressure lower, a lower throttle pressure would be indicated; but if the ratio were smaller or higher process level needed, a higher initial pressure would be required for the right balance for maximum by-product power production.

What to tell your new employees

Here are twenty points that should be outlined to all new employees. So doing will help improve management-employee relations by keeping misunderstandings to a minimum.

THE SPEED with which a new employee fits into the smooth operation of any company depends in great measure upon how quickly he adapts himself to the system used in the plant, the things that concern his job and himself as an employee and how long it takes him to acquire a knowledge of the firm's operations and its policies.

It has been found good practice to post such information on the employee bulletin board and keep it up to date or to prepare a mimeographed or typewritten statement of the basic policies and rules established for the operation of the business.

Such procedure enables new employees to know from the beginning where they stand, reduces mistakes and misrepresentations which abound when word-of-mouth procedure is followed, and gives the employee a fixed guide to which he or she can refer when in doubt on a specific point.

What shall we tell the new employee to attain the above purposes? Here are points culled from many such employee guides used not only by pulp and paper manufacturers but other types of business and industry as well. To these, which can form the basic information, should be added others they will suggest and which will be peculiar to the individual operation.

1. Work hours. The starting and quitting time on each work day should be set forth and provision made for any deviations therefrom, such as work on holidays or week ends.

2. Overtime. The conditions under which overtime pay is made by the firm; how it shall be figured and the method by which it is handled.

3. Vacations and holidays. Explicit information as to which holidays are celebrated by the firm and what are the wage rules thereof. So also should specific information be supplied as to vacation policies of the institution, how they are determined and whether or not they are paid vacations.

4. Salary. While exact wage rates cannot always be given it is advisable that they be set forth in such instructions if possible to do so. Such data should also give the method of computing the work week or period during which each salary check is figured and the day on which salaries and wages are paid.

5. Bonus offers should be clearly set forth with terms and conditions in simple language that cannot be misunderstood.

6. Pension plan, if any, should be outlined in sufficient detail to cover cost, benefits, refunds on cessation of employment, etc.

7. Deductions. All standard salary deductions made, such as withholding, social security, etc., should be clearly explained and exact figures given if at all possible to do so. The employees should be made fully aware of how much of their salary is being withheld for tax and other purposes and the impression that the "take-home" pay is the actual salary avoided.

8. Optional benefits. All employee services that are optional such as health and accident plans, insurance plans, etc., should be explained and actual cost to the employee set forth. (Note—A number of firms in issuing mimeographed instructions of this nature leave blank the amounts for such items as numbers four, six and eight above and fill in the actual amounts as pertain to each employee upon presentation of the pamphlet.)

9. Employee suggestions. Note should be made that the management at all times appreciates suggestions from employees as to how all can do a better job, that such suggestions will be encouraged and the procedure for transmitting these suggestions to the management should be outlined. If the firm has a policy of award for acceptable suggestions the system should be explained in detail.

10. Advancement. Everyone who goes to work on a new job is immediately interested in the possibilities for a better job in the organization and how he or she can work toward that better position. Any instruction sheet should contain a word of encouragement to the new employee on this point.

11. Seniority. Where seniority is involved in determination of employee rights or wage payments the rules for its operation should be set forth as well as penalties involved through quitting one's job, etc.

12. Absenteeism. Company rules for employees such as pertain to being late for work, absences, etc., as they affect his or her job should be outlined in detail. Permissible absences for personal reasons should be explained in detail. How work may be made up or shared by another employee, pay involved in such absences, etc., should be presented.

13. Rules of conduct. The practices during work that will and will not be tolerated should be set forth in clear-cut language so that there can be no possibility of any misunderstanding.

14. Rest periods. Rest and lunch periods should be a definite part of any such schedule, the length and time set forth and penalties for abuse outlined.

15. Grievances. Settling grievances that may arise is another problem of the new employee. If the firm has established a method for handling grievances the new employee should be told how he or she can go about using this system when they feel it is needed.

16. Unions. Relationship between company and unions should be explained. Make clear whether or not new employees must join a union and the procedure to be followed.

17. Facilities for employees such as rest rooms, lunch rooms, lockers, etc., should be explained and rules for their use presented.

18. Safety. Importance of safety should be emphasized and general plant rules outlined. Precautions for particular jobs should be given in connection with job instructions.

19. Emergencies. What to do in case of emergencies should be outlined in detail so that every employee can understand what is to be done and so that every employee may fully understand his or her responsibilities under such circumstances.

20. Lost and found. What should be done in handling lost articles found in the course of the employee's work should be set forth.

Such an instruction sheet for the new employee not only serves its purpose of getting him acquainted with his job a lot better and much quicker than otherwise but also assures him of the firm's interest in his welfare.

Paper and paperboard making—XVI

HARRY WILLIAMSON

Beater Operation Studies—Part 1

A PROFESSIONAL ASSIGNMENT undertaken by the author during 1949 was a detailed study of a paper mill which manufactures only the highest grades of wood fiber papers and some specialty papers with a furnish of 100 per cent rag and cotton linters. This study was designed to close up to still smaller dimensions the loopholes of loss by error or family operation and to offer recommendations for increased production while still aiming for the highest level of quality grade for grade.

In order that the reader may extract the fullest value from the detailed excerpts from that assignment included in these writings, he must understand this mill is successful; management, operating and technical control positions are filled by men fully qualified by training and experience; machine tenders and beater engineers are men drawn from an environment of at least two generations of papermaking families.

The reader with a touch of cynicism in his makeup may well ask: . . . "If the mill is that good, why should management need to call in outside advice?" That is easily answered: They realize that no one of them, each concerned with his daily routine, can afford the time and patience necessary for a detailed, minute study and correlation of the operations of the whole mill without neglecting some part of his daily routine. Moreover, the man called from the outside is a focal point for the open discussion and clearing up of the diverse opinions of the inside men.

The author wishes the reader to be in possession of all the facts pertaining to the statements he will read. These statements should be read and analyzed so that the reader will form his own conclusions and get his full value. They should be read and studied by using the money comparison which usually brings all of us to a common level of understanding. The monetary return to this author for writing all of this book (not just a section of it) will be cigarette money compared to the actual cash received from the management of this mill for making this analysis.

The figures and graphs presented in this and succeeding installments are the results of many weeks of effort. If you do not agree with the author's conclusions, you will at least have at your disposal the basic data from which to draw your own conclusions.

It is suggested that the reader refer to Questions and Answers on Beating which appeared as Installment IV of this series (June, 1950).

Work done by five beaters on five different furnishes

Each study, expressed in graph and figure form, is comprised of three complete cycles of beater work done on the *same furnish* and on the same day. (Heavy weight excepted, one cycle only.)

Each graph of one cycle of beaters is representative of three cycles of five beaters. Work done by each beater each cycle is consistent. Work done by individual beaters *varies* in the amount of TIME required to perform the work on the *same* furnish.

The fact that each beater performs at very nearly the same time rate each time it is charged with the same furnish verifies the manual accuracy of the operators and their adherence to the written instructions.

The fact that *there is* a *variation* in the *amount* of work done between individual beaters establishes this variation of results as a difference in the efficiency of the mechanical units.

The *immediate correction* of this variable amount of work done by beating is, therefore, a *unit* allocation of TIME, HORSEPOWER WORK proportionate to the efficiency of the individual beater as found by test. The in-put horsepower is the same for each beater.

Such mechanical features as the peripheral fpm speed of the beater rolls, the number, thickness and spacing of the beater bars—blunt edged—are arranged to provide beating with a minimum cutting of the physical dimensions of the fibers. The consistency of the furnish in the beater is carried between 4.8 per cent and 6.2 per cent, according to grade of paper made.

The work done by the beaters, as measured by time freeness may be accepted, therefore, as hydration, and *not* CUTTING.

The TIME RATE of work done by *any beater* will be proportionate to the resistance to the applied force of the beater represented by the value of the furnish in the *same* beater.

For example: A 100 per cent rag furnish will require a much longer time to develop a given freeness value than the time required to develop the same value with a furnish of 50 per cent rag and 50 per cent cotton linters. As the opposite extreme: A furnish of 100 per cent soft hardwood or bleached soda pulp would only require disintegration from lap form and dispersion to individual fibers; probably no more than ten minutes of the same applied force per beater, to present a much higher freeness value (using the S/W method of freeness test, the higher the freeness figure, the more slowly the water drains from the pulp), than would be obtained by five hours of hard beating on 100 per cent rag stock.

It is vitally important for uniformity of strength values and to minimize such potential distortions of the finished paper as wavy edges, cockles, uneven stretch, etc., to recognize and *control* the freeness value obtained by BEATING as distinct from the freeness value obtained by the addition of finer shorter fibers such as soda pulp, or loading materials such as clay and titanium, synthetic colloids such as starch and

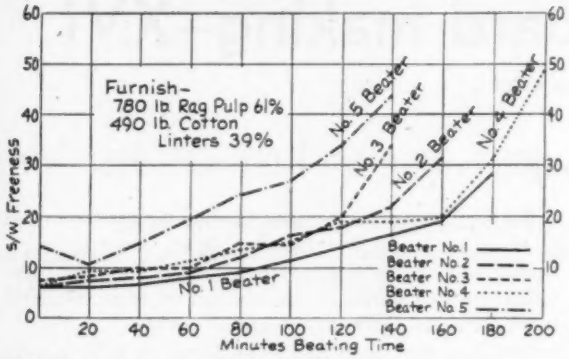


Chart I—Five beaters on one furnish

size (called synthetic to distinguish them from the colloidal jell of hydration).

On each of the graphs, an arrow marks the dividing line between the work done by *beating* on the BASE furnish and the subsequent freeness values obtained after the addition of the secondary furnish and the sizing agents.

Companion Charts (marked with their respective numbers and the letter "A") record the freeness value of the mixture of all beaters entering the jordan, leaving the jordan, and the actual *operating freeness value of the stock and white water* at the machine HEAD BOX.

By this means, an actual record is made of the CUTTING work done by the quarter-inch thick, wide spaced jordan bars; and, an ACTUAL RUNNING record of the effect on water drainage TIME of the loading materials, fine particle sized fibers, colloids in solution in the white water; all of which will be referred to as FINES, contained picked up, or shed through the wire mesh as the FORMATION VALUE, hydration, or CUTTING, of the stock coming to the paper machine changes.

The five furnishes chosen for this study are fully representative of the full range of papers made in this mill. They also offer a wide range in the amount of RESISTANCE FORCE of the furnish to the mechanical and in-put HORSEPOWER FORCE of the beaters.

The results, expressed in graph and figure form, therefore, provide a *true* unit of measure for the allocation of TIME, HORSEPOWER WORK for all five beaters to perform the *same degree* of the most important work; that is, the development of the BASE furnish.

Table 1—Percent total fiber furnished

	Weight (lb.)	Extra Strong	Very Strong	Strong	Medium Strong	Weak
(1)	780 Blea. rag pulp	61	—	—	—	—
	495 Cotton linters	—	39	—	—	—
(2)	525 W. Alpha	—	36	—	—	—
	540 No. 1 Alpha	—	—	37	—	—
	450 Soft hardwood	—	—	—	—	27
(3)	625 Blea. kraft	—	—	43	—	—
	795 Blea. sulphite	—	—	—	57	—
(4)	300 Blea. kraft cellate	—	—	20	—	—
	825 Blea. sulphite	—	—	—	57	—
	325 Blea. soda pulp	—	—	—	—	22
(5)	1100 Blea. sulphite	—	—	—	73	—
	400 Soft hardwood	—	—	—	—	27

Five furnishes selected fiber only

The designation strong, medium strong, etc., is used in relation to the inherent resistance of the fibers in relation to work required by beating to develop them to their full value and not necessarily to the value actually necessary to develop for the grades of paper made (Table 1).

As the paper made from the first furnish (rag and cotton linters) was a specialty which had to be made to very close specifications, the five beaters were operated as a single batch; that is, they were all beaten off so that the average value in the reserve chest and machine chest system would give the desired operating freeness value. All other furnishes were operated as a continuous supply each beater being dumped to the reserve chest as soon as it was beaten off.

Chart No. 1
Rag pulp and cotton linters

Throughout this run the author made all tests at all vital points once every 20 minutes for a period of nine hours. By this means, the data gathered makes a very fine foundation chart of work done and TIME RATE OF WORK for comparison with all other proportionate furnishes used in this mill.

1—Note RATE of development freeness at the end of each hour and total TIME and freeness for each beater.

2—No. 5 beater performs a steady rise in work done from the end of the first 20 minutes to the 80-minute mark. During the next 20 minutes, a slower rise and for the last 40 minutes a steady and even development of the fibers.

3—No. 3 beater works against this hard furnish slowly and at the end of one hour has performed about one-half the work done by No. 5. During the next 20 minutes, good work is done, and then for the period between the 80 and 100-minute mark a flattening out. Between 100 and 120 minutes a steady rise comparable to No. 5, and for the last 20 minutes a very *rapid* development. It is very probable that this beater carried to 160 minutes would have shown a freeness value equal to that of No. 5 beater for 140 minutes. However, it was decided that a mixture of the two would yield the desired results.

4—Until the end of the first hour, No. 4 beater followed the same development curve as No. 3. The rise was then steady reaching exactly the same point as No. 3 at the end of the second hour. The flattening out period of this beater was quite prolonged (see transition from harshness to flexibility re hydration), lasting 40 minutes. The rise between 160 and 180 minutes was not quite as rapid as the last 20 minutes of No. 3. It was decided to run this beater still another 20 minutes making a total beating time of three hours and 20 miutes. The work done in this last 20 minutes was full and very rapid.

5—No. 2 beater develops slowly and below Nos. 3 and 4 to the end of 80 minutes. In the next 20 minutes, a moderately sharp rise placing the results slightly higher than Nos. 3 and 4 at the end of 100 minutes. The flattening out period is for only 20 minutes and is not so positive as that occurring in 3 and 4;

about equal to the similar period occurring in No. 5. The rise from 120 to 140 minutes is steady but not very fast. The rise in the last 20 minutes is good and equal to No. 5. Total time for this beater, two hours and 40 minutes. It is very probable that should this beater have been carried for a further 20 minutes, the rise would nearly equal that of No. 4.

6—No. 1 beater—very little development for the first hour, then a slow and steady rise to the 160-minute mark. At the end of two hours and 40 minutes, this beater had developed its charge to exactly the same degree of freeness as that arrived at by No. 5 beater in one hour. However, the last 20 minutes showed the rapid rise which indicates the transition of the stock from HARSH to SLIP. It is very probable this beater would have made a rise from 29.0 S/W to 38.0 S/W freeness if carried further another 20 minutes.

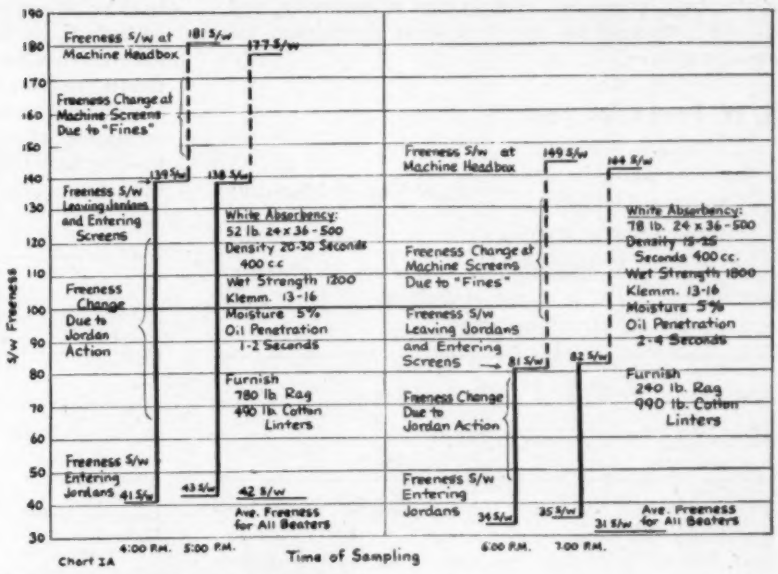

S/w Freeness
Freeness S/w at Machine Headbox
181 S/w
177 S/w
Freeness Change at Machine Screens Due to "Fines"
139 S/w
138 S/w
Freeness S/w Leaving Jordans and Entering Screens
White Absorbency: 52 lb. 24 x 36 - 500 Density 20-30 Seconds 400 cc
Wet Strength 1200 Klemm. 13-16
Moisture 5%
Oil Penetration 1-2 Seconds
Freeness Change Due to Jordan Action
Furnish 780 lb. Rag 490 lb. Cotton Linters
Freeness S/w Entering Jordans
41 S/w
43 S/w
42 S/w
Ave. Freeness for All Beaters
4:00 P.M.
5:00 P.M.
Chart 1A
Time of Sampling
Freeness S/w at Machine Headbox
149 S/w
144 S/w
Freeness Change at Machine Screens Due to "Fines"
Freeness S/w Leaving Jordans and Entering Screens
81 S/w
82 S/w
White Absorbency: 78 lb. 24 x 36 - 500 Density 15-25 Seconds 400 cc.
Wet Strength 1800 Klemm. 13-16
Moisture 5%
Oil Penetration 2-4 Seconds
Furnish 240 lb. Rag 990 lb. Cotton Linters
Freeness Change Due to Jordan Action
Freeness S/w Entering Jordans
34.5 S/w
35 S/w
31 S/w
Ave. Freeness for All Beaters
6:00 P.M.
7:00 P.M.

Chart 1A—Freeness change in jordans and from "fines"

Chart 1 "A"

This chart shows the developed value by beating as measured by the S/W freeness test of the stock from all five beaters mixed together. This average value is 42 S/W freeness; or 42 seconds to drain out all the FREELY FLOWING water *through one gram of bone-dry paper.* In addition, this chart also shows the freeness at all the points *after* the beating of another run with the proportions of furnish changed to only 240 lb. rag pulp and 990 lb. cotton linters. Moreover, the specifications of the second furnish are 78 lb. 24 x 36 - 500 with a densometer test of maximum 25 seconds for 400 cc. air as compared with the sheet with the predominantly rag furnish of 52 lb. 24 x 36 - 500 with a maximum density requirement of 30 seconds for 400 cc. air. The *heavier* sheet has the *lower density.* The reader should find this chart interesting.

The chart then shows the freeness value of the stock

(a) Entering the jordans
(b) Leaving the jordans
(c) Paper machine head box

Note: the average consistency of the stock going *into* the jordan, 2.7 per cent. Jordans equipped with thin cutting bars. Each jordan driven by motor, amperage recorded. With this tackle and the power used, and with a consistency of 2.7 per cent, *all* the *work* done by the jordans was *cutting* with a *shear* cut. There was *no* hydration. As the wire trim return from the wire pit was returned to the save-all, and thence to the machine chest, the freeness value going into the jordans was, of course, gradually raised. As there was no loading in this furnish, no size or synthetic colloids, this raise was negligible, not appreciable. Note sheets in furnishes carrying high clay content.

Work done by beaters

$$\frac{\text{Time}}{\text{Freeness}} = \text{Time Rate of work done}$$

Table 2—Minutes per degree of freeness and cost of power for fiber development; rag and cotton linters Furnish No. 1; initial freeness of raw stock furnish 6.0 S/W; each beater driven by 100 hp. belt-driven or Reeves drive motor

Beater	Time period (minutes) 60	120	140	160	180	200	Total degree Freeness	Cost per ton rag furnish*
No. 5	3.076	3.519	3.181	....	....	....	44	$1.691
No. 3	6.082	6.630	4.117	....	....	....	34	1.691
No. 2	7.500	7.894	5.454	4.920	4.285	....	42	2.177
No. 4	5.714	7.059	7.368	8.000	5.625	4.081	49	2.417
No. 1	8.000	8.571	9.655	8.421	6.207	4.285	46	2.417

(*) 100 hp. equals 74.6 kw. average charge 0.00973 per kw-hr.

The importance of the difference in cost per ton of stock developed (Table 2), appreciable as it may be, is still of secondary value to the total cost incurred by variable rate time of work done. A wide range of power consumption time to produce approximately the same degree of freeness test; a range of 173.8 kw-hrs. for No. 5 beater to a maximum of 248.4 kw-hrs. for No. 1 beater is far too wide a bracket for uniform production on a furnish hard to develop. Unless provided for in operating instructions to the beater room, variation in quality of finished paper is bound to result at intervals of freeness change of the work done by the *beaters.* Adjustment of the jordan, while it will bring the freeness test to the *correct* figure, will *not* replace the values of development which should have been done by the *beating* of the furnish. The freeness developed by beating is a measure of the development of the flexibility and hydration of the stock. The freeness brought about by the *cutting* of the fibers by the

jordan bars is mainly a contribution to *formation*, and, in conjunction with the hydration developed, the FINAL DENSITY.

S/W Freeness test

$$\frac{\text{Time in seconds for free water to drain}}{\text{Bond-dry weight of sample formed (grams)}} = \text{S/W Unit of Measure}$$

Bone-dry weight of Sample X 3 equals consistency of *wet* sample. S/W is a unit of measure of *work done* and *consistency* simultaneously.

Examples	Seconds	Grams	S/W Freeness (sec.)	Consistency (per cent)
Raw Stock, rag	16	2.0	8	6
Beaten stock	80	1.9	42.22	5.7
Jordaned stock	126	0.9	140.0	2.7

The measuring scoop for the wet sample, instead of squeezing and weighing the sample, facilitates a freeness test of very thin mixtures such as the mixed volume at the head box by using multiple fillings of the scoop to one sample to be tested. In such a test, the consistency equation is bone-dry weight x 3 divided by number of scoopsful used.

Example	Seconds	Grams	S/W Freeness (sec.)	Scoops	Consistency (per cent)
Head box stock	144	0.8	180	4	0.6

Measurement of work done by stock preparation units

No. 1 Furnish

Initial freeness (raw stock)	S/W	6 sec.
After beating	S/W	42 sec.
Work done by beaters	S/W	36 sec.
Entering jordans	S/W	42 sec.
Leaving jordans	S/W	140 sec.
Cutting work done by jordans	S/W	98 sec.

In this furnish, no loading materials or sizing agents of any kind were used. We, therefore, have a good opportunity to measure the effect of actual fine particles of fibers which pass into the closed white water system of the paper machine by passing through the fine mesh of the fourdrinier wire. Chart I "A" shows two furnishes:

The first furnish, beating and jordaning values recorded above, is a proportion of 780 lb. rag pulp and 495 lb. cotton linters. The second furnish contains less rag pulp and 495 lb. cotton linters. The second furnish contains less rag pulp and very much more cotton linters; namely, only 240 lb. rag pulp and 990 lb. cotton linters. We must also remember the cotton linter furnish is to be 78 lb. ream weight with a lower density than the rag furnish with 52 lb. ream weight. Almost a law of opposites. The lower density, heavier paper, therefore, had to have *less* hydration and *less* cutting because of the extra weight. However, the cotton linters, breaking up much more easily than the rag fibers, were increased to give fine fiber as an aid to formation without *much work* by the preparation units. Please note wide difference in measurement of *fines* between the two furnishes.

Relative to each other, only the 52 lb. rag paper could be called the hydrated stock and the 78 lb. paper the free stock. This author particularly wishes to draw attention to the absence of loading materials in both these furnishes when studying Chart I "A". All the other furnishes contain loading and sizing materials; the reader, therefore, has available a direct comparison of *fines*, of fine particle size only, and *fines*, composed of various proportions of fiber fines and loading fines held together by colloids in suspension in the white water.

S/W Freeness Machine Screens

Lb. Weight 24x36— 500	400 cc. density (sec.)	Freeness Leaving jordans (sec.)	Machine head box (sec.)	S/W gain Fines (sec.)
52	30	140	180	40
78	25	82	146	64

Cotton Linter base furnish Chart I "A"

Initial freeness (raw stock)	S/W	11 sec.
After beating	S/W	31 sec.
Work done by *beaters*	S/W	20 sec.
Entering jordans	S/W	34 sec.
Difference in freeness due to trim from machine pit	S/W	3 sec.
Leaving jordans	S/W	82 sec.
Cutting work done by jordans	S/W	48 sec.

It is to be noted that the sheet with the *least* development of hydration and the greatest percentage of cotton linters; a type of fiber which will produce more loose fine particles of fiber than will rag fiber, passed much more fine particle size fiber fragments through the wire mesh than did the better beaten rag fiber. This despite the fact that the forming sheet was 26 lb. ream weight *heavier*.

The small change in freeness between the stock from the composite work done by the beaters and the actual delivery at the jordan inlet is due to the *fines* contained in the white water used for dumping the beater; operating at 6 per cent and dumped at approximately 3 per cent. On this *unloaded* sheet of 78 lb. ream weight, the increase was only S/W 3 seconds. The reason no change of this nature occurred on the preceding 52-lb. sheet was because this weight was the beginning of the run and all fresh water was used. In changing to 78 lb. of the same general grade and quality, the white water in the system was used, and a running machine change made. Hence the slight change in S/W.

Such a small change is not wide enough in S/W bracket to make any appreciable difference in machine operation. However, the reader will note as other furnishes with clay loadings are used, the S/W change from this cause and the return of the trim waste from the wire pit to the machine chest via the save-all can, and does, make serious changes in the freeness value of the stock at two important points.

1—White water for dumping the beater will raise the freeness value over the value recorded by the actual beating.

2—Trim waste from the wire pit to the machine chest will raise the freeness value over the value recorded by the actual jordaning.

When manufacturing papers which will show an ash per cent of from 8 per cent to 12 per cent, such variations will grow to serious dimensions causing variation in quality of finished paper, drying rate, and ream weight.

BANQUET at the Multnomah Hotel ends the Superintendents' annual convention.

Superintendents Meet on West Coast

More than 700 delegates attended the annual convention of The American Pulp and Paper Mill Superintendents Association, staged in Portland, Ore., in June. It was the first time in the 32-year history of the organization that the meeting was held on the West Coast.

This year's convention featured a 250-mile woods trip to the 130,000-acre Clatsop Tree Farm of Crown Zellerbach Corp. in northwest Oregon; visits to several modern pulp and paper mill operations; general conferences on the broad problems of pulp and paper manufacture, and technical discussions on various phases of the industry.

Highlight of the three-day gathering was the election of Glen Sutton of Sutherland Paper Co., Kalamazoo, Mich., as president. He succeeds Charles E. Ackley of Crown Zellerbach's West Linn Division.

General Conference Hears Experts

With Mr. Ackley presiding, the yearly general conference of delegates heard three men prominent in paper circles analyze major questions facing the industry today. Depicting past practices in pulp manufacture, Lawson P. Turcotte, president of Puget Sound Pulp and Timber Co., declared that an optimistic view of future pulp production is possible if governmental and private interests can continue their program of providing new growth equal to the drain. He called for further exhaustive research in the field of reforestation, declaring that "if the trend of new growth as against removal continues as it has

COMMITTEE MEMBERS get together at the convention. L to R: front row—Dorothy Stone, H. E. Weston, R. Burke Morden, Gus Ostenson, C. E. Ackley, M. E. Norwood, R. T. Petrie. Back row—M. Maguire, J. M. Fulton, R. M. True, L. D. McGlothlin, H. W. Beck, L. M. Shanaman, W. Salmonson, G. Petrie, and R. Baer.

Superintendents' convention visits tree farm

Topping a tree

Tree felling gets attention

Strapping load before dumping

Mr. and Mrs. Oscar Cordes

Neil Robertson, Murray Bennett

Mr. and Mrs. Frank Kreiling

during the past 20 years, the life of saw timber can be extended many, many years."

Following Mr. Turcott's address, a paper by Dr. Louis T. Stevenson, economist for the American Paper and Pulp Association, was read in his absence by Harry E. Weston, secretary and treasurer of the Superintendents Association. Dr. Stevenson declared that so essential is paper to the nation's economy that without a constant supply the vast majority of our industrial and governmental activities would be forced to halt operations. "Its use is essential," he said, "to the operation of our governments, local, state and national; to our banking system; to our systems of communication; to our system of distribution, and, above all, to our Armed Services. . . . The paper industry is, of course, a service industry, and it is therefore dependent upon general business activity for its own activity. But it must be remembered that whatever business is done demands the use of paper as a necessity. Business cannot be done without paper."

The general conference also heard a report by Stuart Moir, forest counsel for the Western Forestry and Conservation Association, on "The Pulpwood Situation in the Pacific Northwest." He stated that "there is ample supply of pulpwood to meet the growing industry of the West if all lands can be brought under more intensive forest management." The need for an increasing timber supply, he continued, must be met squarely and honestly, first, by utilizing more of the volume of timber harvested; second, by the application of sound forest practices; third, by improved forest management, and fourth, by the reduction of losses from insects and fire.

In the technical meetings held throughout the convention a wide variety of subjects vital to the industry were discussed by outstanding experts in the field. Included in the general topics were papermaking, sulphite, kraft, board, woods and wood preparation, and finishing. New methods and equipment were presented for general discussion. A total of 26 papers were presented during the series of meetings. (See page 528.)

For many of the delegates from the Middle West the convention included a rather extended tour in addition to the official field trips. More than 100 visitors journeyed to Portland via the "Papermakers' Special" on the Great Northern Railroad. Beginning its trip at Chicago, the train touched such scenic spots as Glacier National Park, Multnomah Falls, and the Columbia River Valley.

Woods Trip

More than half of those attending the 1951 convention took advantage of the opportunity to tour the Crown Zellerbach Clatsop Tree Farm. The trip included an inspection of C-Z logging operations. The route cut through the northern part of the famous "Tillamook Burn" area, a 300,000-acre tract that has been swept by three disastrous fires, in 1933, 1939 and 1945. It has been predicted that 14 billion board feet of logs can be salvaged from the region, an amount exceeding the green timber cruise of 1933. Approximately 8 billion board feet of dead timber has been logged to date. A wide-scale reforestation program is being undertaken in the area through a $10,000,000 grant by the state legislature.

The Clatsop Tree Farm, bounded by the Columbia River on the north and the Pacific Ocean on the west, has grown so that it now exceeds more than 200 square miles. Although western hemlock predominates, other commercial stands include Sitka spruce, Douglas fir, western red cedar, balsam fir, and red alder. The farm is composed of a balanced structure of virgin old-growth timber, selectively-logged stands, young second-growth stands, and reforested cut-over lands.

Mill Visits

On the second day of the convention delegates toured mills in the Portland region. The visits included Longview

Lunch stop

Mr. and Mrs. Vincent Owens

Mr. and Mrs. C. W. Converse

Mr. and Mrs. Lester LeLiberte

William Stitt, Allan Hyer

Mr. and Mrs. Sven Fahlgren

Fibre Co. and Weyerhaeuser Timber Co., Longview, Wash.; Crown Zellerbach Corp., Camas, Wash.; Publishers Paper Co., Oregon City, and Crown Zellerbach, West Linn, Ore.

First Mill Commemorated

A field trip of historic significance was staged in addition to the ones arranged solely for practical value. About 50 delegates, headed by President Ackley, dedicated a plaque in Oregon City in commemoration of the state's first paper mill. The marker, erected by the association's Pacific Coast Division, read, "Near this spot on the east bank of the Willamette River during the early part of 1867, W. W. Buck and Associates placed into operation the first paper mill in the state of Oregon." It was the third such plaque erected under the sponsorship of the superintendents' association. The other two are at Germantown, Pa., and Milwaukee.

Business Sessions

The business meeting featured the election of officers for the coming year and the president's annual message. In a brief summary of the association's activities during the past year, President Ackley noted that in 1950-51 some 100 active members and 20 affiliates had been added to the roster of the organization. In looking to the future, he said that "if the association is to prosper and continue to grow, it must undertake new and larger projects that will be educational to men of the industry. . . . I can see much progress in the paper field—the use of new raw materials that are being made available and the use of resins added to the paper pulps thereby making products that can be used for many purposes." President Ackley concluded by thanking those who worked with him on various committees and also the managements of mills represented for arranging the time of their executives so that they could attend the convention.

Social Activities

Traditional West Coast hospitality featured not only the business and technical portions of the convention but also the busy schedule of social events. In cooperation with the Pacific Coast Division of the association, the regular convention committee arranged such events as special luncheons, golf tournaments for both men and women, dances, cocktail parties, and a complete three-day program for the entertainment of delegates' wives.

"The Start-Up" was the title of a skit presented by the International Brotherhood of Migratory Peddlers at their annual Wake 'Em Up Breakfast. The production, written and directed by Ted Hallock, featured President Ackley and a paper crew depicting the trials and tribulations encountered in operating a balky paper machine.

At a special luncheon for delegates, the Hon. Matthew T. Hill, associate justice of the Supreme Court of the State of Oregon, presented an address entitled, "Americanism." Gus Ostenson, convention chairman, presided. And on the closing day of the convention Dr. Lauren Donaldson, director of the Applied Fisheries Laboratory at the University of Washington, spoke on the topic, "Bikini—Operations Crossroads."

The annual banquet brought the meeting to a close. President Ackley was the toastmaster. A floor show and dancing were featured.

New Officers

In addition to the newly-elected president, Glen Sutton, the following slate of officers was presented by the nominating committee and duly elected for the coming year: 1st vice president, Gordon K. Singletary, Brunswick Pulp and Paper Co., Brunswick, Ga.; 2nd vice president, Donald R. Dick, Howard Smith Paper Mills, Ltd., Cornwall, Ontario; 3rd vice president, Harry E. Hadley, Gardner Board and Carton Co., Middletown, Ohio; 4th vice president, Howard H. Street, National Vulcanized Fibre Co., Yorklyn, Del., and 5th vice

A. Coffin, J. McAlear, W. Martin, K. Battenfield

Mrs. Temple, J. Scheuerman, R. Temple, Mrs. Scheuerman

J. Dempster, W. Murray, J. Hammett

W. Holt, H. A. Des Marais, R. Barton

S. A. Collicutt, J. W. Hemphill

Mr. and Mrs. Hank Jones and daughter

J. L. Janecek

Norman Scott

John Chandler

president, Martin J. Auchter, Hoberg Paper Co., Green Bay, Wis.

Two past presidents of the association were elected to serve on the board of directors. They are Roy Kelly, resident manager of the paper and pulp division, Marathon Corp., Rothschild, Wis.; and Howard H. Harrison, vice president in charge of manufacturing, Crystal Tissue Co., Middletown, Ohio. Continuing members of the board are Trustees Fred C. Boyce, Milwaukee; William H. Brydges, Lynchburg, Va., and Raymond L. Barton, Plainwell, Mich.

Held in conjunction with the convention was the 10th annual meeting of the Industrial Affiliates Committee of the Superintendents Association. Allan Hyer of Bagley and Sewall Co., chairman, presided. The group elected new officers as follows: W. K. Metcalfe, J. O. Ross Engineering Corp., chairman; Walter Morehouse, Nopco Chemical Co., first vice chairman; Arnold Plier, D. J. Murray Mfg. Co.; R. Burke Morden, Morden Machines Co.; Edward F. Gillen, Anheuser-Busch Co.; J. P. Bauer, Ciba Co., Inc.; George Docherty, Holyoke Wire Cloth Co.; A. E. Poirier, Poirier Control Co.; Louis Allis, Jr., Louis Allis Co., and V. A. Spoehr, H. M. Harper Co.

Convention Committees

Serving as convention manager was Harry E. Weston of Chicago, association secretary and treasurer. L. R. Hartman, chairman of the Pacific Coast Division, acted in an advisory capacity. Gus Ostenson was convention chairman. Other convention committee members were R. Burke Morden, housing, registration, food and printing; L. R. Hartman and H. R. Russell, program; Harry E. Weston and Z. A. Wise, publicity and travel; H. A. Des Marais, reception; W. A. Salmonson, entertainment; J. M. Fulton, ladies' program; M. E. Norwood, mill visits; C. W. Richen, woods trip; R. T. Petrie, local transportation; L. M. Shanaman, golf; R. M. True, finance, and Norman O. Weil, allied industries get-together party.

Papers Presented At Portland (Abridged)

Problems Relative to a High Speed Kraft Machine

John A. McDermott, paper mill superintendent, St. Regis Paper Co., Tacoma, Wash.

Paper machine speed is almost altogether dependent on the quality of pulp furnished. And in developing higher-speed machines the following problems have developed: (1) the arrangement for sheet pick-up, improvements on which will allow more and more speed; (2) the tendency of stock sheet to stick to the couch; (3) head box design, with the pressure type offering more encouragement, although the closed type is being improved, and (4) the development of more efficient wires.

Advantages have been gained from deflectors on the wire and suction box improvements, but still the most critical spot

and principal source of trouble from stock sticking is the couch roll. Using a narrow suction section on the couch is more satisfactory. Also important in the development of speedier paper machines are increases in the drying rates at high temperatures, due to proper water and air removal, and improved control mechanisms.

How We Keep Our Machines in Tip-Top Shape

R. P. Wollenberg, chief of the engineering division, Longview Fibre Co., Longview, Wash.

At the Longview Fibre Co. a close check is kept on the need for and the actual performance of repair work on paper machines by means of a complete system of card filing. Results of periodic inspections are placed on individual cards, which are then filed for ready reference. In this manner the mechanical inspection department, mechanical superintendent, maintenance engineer, and machine operating superintendent are enabled to tell at a glance when and where repair work is needed. The machine operator is held responsible for the condition of the machine.

Such a card system eliminates interference of maintenance men who plan to work on various parts of a single machine. In this connection, a generous provision for spare machine parts is extremely advisable.

Problems Relative to High Speed News Machines

A. E. Hansen, assistant paper mill superintendent, Powell River Co., Ltd., Powell River, B. C.

The important problems relative to the operation of a high speed news machine are stock variation and consistency, stock flow, wire life, head boxes, sluices, and couch noises. At the Powell River mill the highest speed on the newest machine has been 1,700 feet per minute, with the average speed generally 1,650 to 1,675 feet per minute. Very important to speedy running are the press rolls and wires. Another major problem is the control of formation. There is a need for improvements in the head box designs and in the elimination of couch noises, since the latter have great affect on the efficiency of the machine crew.

The Manufacture of Insulating Board

Charles L. Walton, manager, Simpson Logging Co., woodfiber division, Shelton, Wash.

Operations at one of the newest insulation board mills in the country, that of the Simpson Logging Co. at Shelton, Wash., comprise 280,000 acres of timber working on a sustained yield basis, two sawmills, two plywood plants, a door plant, and a woodfiber plant. The raw material used at the woodfiber plant is taken entirely from sawmill slabs and edgings and wood trimmings, which are reduced to chips, 20% going to an American Defibrator Co. Size "D" Asplund and 80% to three rotary steam cookers lined with stainless steel. The next step is to the Bauer pulper, then to the washers and filter and finally to a Downington fourdrinier type board former.

Design of Cylinder Machine Vats

Philip H. Goldsmith, sales and development engineer, Pusey and Jones Corp., Wilmington, Del.

A consistency low enough for good fibre dispersion must be insured by sufficient drainage capacity in cylinder machine vats. The three methods of increasing drainage capacity are (1) by using larger cylinder molds, (2) by using more of them, or (3) by utilizing vacuum cylinder molds.

PLAQUE AT OREGON CITY marks the state's first paper mill, now occupied by Publishers Paper Co. Superintendents Association held dedication ceremonies during the convention. L to R: H. E. Weston, Raymond Barton, C. E. Ackley, F. T. Griffith, F. C. Boyce, and Carl Braun.

In stream-flow vats and flow spreaders recent design improvements have been in the direction of stainless steel flow surfaces with mild steel stiffening flanges, and in simplification to cut down cost. The cost of a modern stream-flow vat is less than twice the amount of a fixed circle direct flow vat of similar materials.

The counter flow type of vat is recommended for pulp wet-lapping machines and in all cases where quality of formation is of no importance.

Wood Handling and Chip Servicing at Camas

William F. Farley, technical assistant to wood mill superintendent, Crown Zellerbach Corp., Camas, Wash.

The Camas, Wash., mill of Crown Zellerbach Corp. is one of the largest specialty paper mills in the world. It uses eight different types of wood, producing 14 different kinds of pulp, making more than 700 tons of paper into thousands of grades and specifications and converting many of these into final products of all types. Handling the wood and producing the chips for this operation naturally requires a very diversified wood preparation system. The complete operation must be done with three thoughts in mind: production in the proper quantity, of the highest quality, and at a cost that will keep the final product competitive.

The first step of the new wood mill went into operation 18 months ago. The mill has many new features that were required because of new logging methods, the use of bundle rafts, the development of the hydraulic barker and the whole log chipper.

The second step of the wood mill is the addition of a 10-foot band mill for log breakdown and the installation of trimmer saws for grinderwood. The band mill is to be operated by one man. A return conveyor with Vee rolls is provided to return logs to the saw should they require further breakdown. An inspection station and log-turning device was provided just behind the barker. A third step is now under construction and will be in operation late this year. This will include a dry log haul from the yard fed by a log pond with a jack ladder on one side and sets of transfer decks on the other, a 30-inch ring barker, and a 107-inch multiknife chipper. This installation will be integrated with the present mill so that either barker can feed logs into either chipper.

The loading methods were slow and costly, and experimentation was done with new systems. As a result the logs are now loaded crosswise in the gondola with a solid stockade at each end and verticle logs every four feet around the sides. Logs above the height of the gondola frame are banded in one-cord units and then the entire load is banded all around the sides. In addition, it is estimated that the unloading rate will be increased to 13 cords per man hour with the mounting of the control cab on top of the crawler crane.

The mill has a farmer wood program in which an average of 200 cords per day are received. With the completion of the third step, this wood will be unloaded onto transfer decks that will feed the new log haul, eliminating further yard handling. The movement of farmer wood from storage to the mill is by skid loaders. It has been found that the best operation for wood handling and tractor maintenance is with the extended track on the tractor.

Along with the new salvage programs in the Northwest, chips are being purchased from suppliers in Washington and Oregon. In handling the chips rail box cars with open top are used together with a suction unloading system with a rated capacity of 24 units per hour.

Wood preparation methods are combined to service the pulp mill. From the 153-inch chipper a flight conveyor feeds the chips to the top of the concrete silo storage bins. From the silos a 42-inch belt carries the unscreened chips to the screen room, where an overhead flight conveyor distributes the chips over the chip feeders. Each screen has a feeder box and a rotary feeder to maintain uniform flow.

Caustic Room Operation

A. C. McCorry, general superintendent, St. Regis Paper Co., Tacoma, Wash.

There is much room for improvement in the caustic department of a kraft mill. In an attempt to accomplish such improvement we have started with the handling of green liquor at the furnace dissolving tanks in a different way than is common practice. We use no pumps to circulate the liquor in the dissolving tanks, only an agitator. We have established a given level at which the liquor flows from the dissolving tank to a receiv-

ing or settling tank, from where it is pumped to the green liquor clarifier. We clarify our green liquor to the highest possible point. Part of the green liquor is then pumped to a rotary slaker of our own design and is then added at the discharge of the slaker to thin it down.

The causticized liquor flows to a two-tray, three-compartment white liquor clarifier. The clear liquor overflow is sent to storage, and the mud is pumped into two single-tray, two-compartment clarifiers, where it is washed. The mud cake to the lime kilns is maintained at around 50% solids.

We are using two lime kilns, which are lined except for the last 20 feet, where a curtain of chain is spaced to provide adequate draft but not enough so that excessive loss up the stacks is experienced. After going through the sprays the hot lime is conveyed from the kilns to a two-compartment storage tank, one side for fresh lime, the other for reburned lime. The bottom has a gate arrangement and a screw to feed the lime into the slaker at a uniform rate.

Newer Trends in Pulpwood Handling

Raymond L. Howerton, manager of sales promotion, Hyster Co., Seattle, Wash.

The use of log bundles that can be efficiently processed from the stump to the mill is the basic problem involved in handling pulpwood. Fifteen factors involved in the solution of the problem are (1) topography, (2) ground conditions, (3) weather conditions, (4) tree characteristics, (5) tree condition, (6) transportation distances, (7) equipment available, (8) logging methods, (9) labor conditions, (10) government and union regulations, (11) safety factors, (12) cost of equipment, (13) production costs, (14) men required, and (15) market conditions.

A trend in pulpwood operations that is certain to be expanded is the handling of pulpwood in mass and bundles. Such is the solution for lower handling costs.

The two types of bundles are loose and tight. The latter requires power equipment with a 7,000-pound pull to tighten the bundle effectively. The equipment necessary, a D-4 Hy Speed Winch, includes a screwy hook, a pelican hook, and a grab hook. The line can be rapidly removed by the sling setter since free spooling is used. Only one man is required to run the tractor and handle bundles of pulpwood. Large bundles of small logs, with approximately 125 logs to a cord, can be easily transported from the woods to trucks, to railroad cars, or to river shipment.

Ethyl Alcohol—Is It a Solution to the Waste Liquor Problem?

Erik Ekholm, vice president, Puget Sound Pulp & Timber Co.

In order to appraise the role ethyl alcohol from sulphite waste liquor will play in the problem of eliminating pollution, two important questions will have to be answered: Can ethyl alcohol from SWL be manufactured economically, competing with ethyl alcohol manufactured from other raw materials; and will the end result satisfy authorities in charge of enforcing pollution laws?

The main sources of raw material for alcohol production at present are: grain, potatoes, blackstrap molasses and petroleum hydrocarbons. Unstable conditions in the market have often caused sharp and drastic price changes in industrial alcohol. Ethylene, however, is and promises to be the most important single factor to influence production of industrial alcohol. From 1930 to 1940 the price of alcohol showed a steady decline, but with the uncertainties of the war years the price went up. Since the end of the war, and partially because of a large sugar crop in the Caribbean, the market price has again reached the 20c level, from a high of around 55c.

Production capacity of ethyl alcohol from SWL on the Pacific Coast is estimated at 11 million gallons per year. The South, as far as alcohol from the Northwest is concerned, is not a good market prospect—both from a standpoint of cost and demand. The cost of manufacturing alcohol from SWL will not be less than 20c a gallon. The Middle West is about the only market left for West Coast producers, but there again freight rates favor the Southern producers. Only time and market conditions will tell the future of West Coast production.

If an approximate reduction of 50% in the BOD demand for SWL will raise the oxygen conditions of the body of water to receive the effluent from the mill, bringing same up to set minimum standards, the cure to a pollution problem, leaving economics out of the picture, could be obtained from the manufacture of alcohol from waste liquors.

During the convention it was determined that the 1952 meeting will be held at the Book-Cadillac Hotel, Detroit, on June 17-19. Mr. Sutton, the new president of the association, declared in his address at the annual banquet that everyone wishing to attend should make their plans immediately.

Recent Developments in Hydraulic Barking

Meder Johnson, Manager, James Brinkley Co., Seattle, Washington

This report on hydraulic barking supplements the detailed report given by L. P. Hill, Jr., at the 1949 meeting of the TAPPI. Since then, there have been no revolutionary additions to the large family of barkers, but some of the barkers, which were quite new at that time, have been in operation long enough so that their advantages and potentialities can be appraised.

Included among these are the Hansel ring barker and the Simons rotary head barker. These barkers account for the majority of new installations. Both of these barkers remove the bark as the log passes through in a direction parallel to its axis. The log is not rotated, and the barker is not hindered in barking crooked or very long logs. As the logs can be fed end to end, there is no time lost between logs. The water reaction is almost neutralized as the jets are opposite each other, and there is little tendency to dislodge or move the log, making the use of hold down rolls unnecessary. The forward travel is slow and sudden acceleration or deceleration of heavy logs is unnecessary—which simplifies the feeding equipment. The Hansel ring barker consists of a continuous rotating ring with nozzles mounted on the inner periphery through which jets of water are directed against the log as it passes through the center of the ring. The nozzles, of which there are two or four, are slotted with the long dimension parallel to the log axis. The width of the slot depends on the quantity of water used. The seals are easily damaged by dirty water and the supply of water must be filtered so that nothing larger than 60 microns enters the barker.

As there is no limitation to the speed of rotation, it is possible to operate at the optimum barking speed which is found to be 25 to 30 feet per second. Average feed rates are from 24 to 80 feet per minute. Water pressures from 1000 to 1400 p.s.i. are used with volumes of from 400 to 1000 gallons per minute. The Weyerhaeuser mill at Longview is installing a barker in which they contemplate using a large volume of water and a high rate of feed.

Since the installation at the Port Alberni mill, the Potlatch Forest Industries at Lewiston, Idaho, has installed a 42" and a 70" barker, and the Weyerhaeuser mill at Springfield has installed a 70" machine. At present, ten barkers are under construction for installation in Canada and Northwest mills.

A recent improvement has been in the re-designing of the supporting mechanism so that most of the drive and positioning equipment is above the ring and away from the bark and debris. Continual improvements have been made on the seals so that long, trouble-free runs can be anticipated.

The Simons barker, often referred to as the "lawn sprinkler type," utilizes two sets of rotating nozzles, one above and one below the log. The nozzles are set at the end of the horizontal branches of a "T" and incline towards each other to form an apex angle of approximately 14°. As the "T's" rotate about the vertical branch, the jets of water generate two cones. The log passes horizontally through the cones and the jets remove the bark from the entire circumference.

The lower head remains in position, but the upper head is raised and lowered to accommodate different log diameters. As there is no limitation to the height to which the upper head can be raised, it is possible to install this barker directly in the mill log haul without restricting the size of logs that can be handled. Such an installation can be seen at the Canadian White Pine Company, Ltd., Vancouver, B. C. The log haul installation is much less expensive than the usual hydraulic barking set-up and brings the barker within reach of many saw mills that would not wish to install the usual more elaborate set-up.

The Hansel ring barker also lends itself to log hauling installations as the ring can be retracted to allow an over-size log to pass. At the Chemainus mill on Vancouver Island, a Simons barker is installed on a roll case parallel to the log haul with provision for indexing and re-barking over-size logs. This barker handles logs up to 80-feet long with no trouble and bark removal is excellent. At the Nanaimo sulphate mill on Vancouver Island, which often operates on very small logs, it has been found that two or more logs can be barked simultaneously.

The Simons barker uses round nozzles which are located in several positions on the nozzle arms and are arranged so that the inner and outer nozzles can be easily plugged off in order to utilize the spacing that is most efficient for the current range of log diameters. Water pressure generally ranges from 1000 to 1400 p.s.i. The quantity varies from 400 to 1200 although there is no practical limit on the quantity as the more that is used, the faster the rate of bark removed. There is no advantage of barking the wood faster than the mill can process it as the barker will then be idle part of the time.

Since Mr. Hill's report, a number of Bellingham-type barkers have been installed. The performance of this barker has been proven by many million board feet of barked logs. Sumner Iron Works, at Everett, Washington, manufactures the barker in a range of sizes. The smaller sizes are put out as package units that come complete with all auxiliary and control equipment except the high pressure pumps. On the smaller mod-

Continued on page 546

PAPER SKETCHES

To prevent the British from capturing a papermaking mold, being used by the Willcox Mill but belonging to the state, the Pennsylvania Council of Safety, in 1778, ordered an American Army colonel to visit the mill and seize the mold.

BLUE paper was used to line the type cases employed in 18th Century print shops. The joiners who made these type cases pasted the blue paper to the case bottoms before fastening on the box frames that held the types.

EARLY Fourdriniers used sheets of felts that were made into belts by sewing the ends together.

SOY BEAN protein is said to be used in 90% or more of the washable wallpaper sold, today, in the United States.

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The Paper Industry Association News

Superintendents Association Plans Fall Gatherings

Six regional meetings have been announced by the American Pulp and Paper Mill Superintendents' Association.

The New York-Canadian Division is planning its Fall meeting, to be held at Saranac Inn., Upper Saranac Lake, N. Y., on September 6-8. According to present plans, the program will include a golf tournament, cocktail party, and banquet. Harry S. Cutler of United Board and Carton Corp., Lockport, N. Y., is the chairman.

The Northwestern Division will meet at Holiday Resort, Marinesco, Mich., September 14-15, with Mace Harris, Northwest Paper Co., Cloquet, Minn., as chairman. The Poland Spring House in Poland Spring, Maine, will be the scene of the Northeastern Division meeting, which is also scheduled for September 14-15. John Coppens of Fraser Paper Ltd., Madawaska, Maine, is chairman.

The next meeting of the Michigan Division will be at the Hotel Harris, Kalamazoo, September 20. Principal speaker will be L. J. Smith, manager of Gould Paper Co., Lyons Falls, N. Y. The topic of his address will be, "The Manufacture of Bleached Groundwood."

Members of the Pennsylvania-New Jersey-Delaware Division will mark their group's 25th anniversary at Pocono Manor Inn, Pocono Manor, Pa., on September 28-29. Glen Sutton, president of the national association, will attend. G. T. Renegar, Container Corp. of America, Philadelphia, is chairman. The Southern and Southeastern divisions will hold a joint meeting October 10-12 at the George Washington Hotel, Jacksonville, Fla. Otha Winningham, National Container Corp., Jacksonville, is chairman.

TAPPI Fall Meetings

Alkaline pulping and paper and pulp mill engineering will be discussed at two conferences to be sponsored by TAPPI this Fall. The Alkaline Pulping Conference will be held at the John Marshall Hotel, Richmond, Va., September 26 through 28, while the Sixth Engineering Conference is to be staged at the General Oglethorpe Hotel, Wilmington Island, Savannah, Ga., October 15-18.

Featured at the conference on pulping, of which Harry Vranian of Chesapeake Corp. is general chairman, will be sessions on wood problems and processes, and on cooking processes. Delegates will have an opportunity to visit Chesapeake Corporation's West Point, Va., plant, and will also tour historic Williamsburg. R. R. Fuller of Gulf States Paper Co., Tuscaloosa, Ala., is program chairman.

One of the highlights at the engineering meeting in Savannah will be the opening general session; with G. H. Pringle of Mead Corp., Chillicothe, Ohio, serving as chairman. Addresses of welcome will be given by G. W. E. Nicholson, Union Bag and Paper Corp., Savannah, and by J. E. A. Warner, Southern Paperboard Corp., Port Wentworth, Ga.

The opening meeting will be followed by technical sessions at which experts on the various phases of papermaking will present papers. Included in the subjects to be discussed will be engineering research and machine design, data sheets, mill design and economic aspects, chemical engineering, hydraulics, electrical engineering, steam and power, drying and ventilating, materials handling, and mill maintenance and materials. Visits will be made to the mills of Union Bag and Paper, Southern Paperboard, and others in the Savannah area.

Michigan Superintendents Enjoy Field Day

More than 115 members and guests of the Michigan Division, American Pulp and Paper Mills Superintendents' Association, participated in the division's annual Sports and Field Day held at the Kalamazoo Country Club July 24. Included in the program were a golf tournament, lawn games, and a banquet.

Among the 26 prize-winners were James Foxgrover (first door); Tom Flanegan (low gross, superintendents); Bill MacArthur (low gross, sales); Fred Goodwill (most money); Howard Mayshaw (low putt, sales); Bill Kirkpatrick (low putt, superintendents), and Claude Bos (first blind bogey).

Members of the committee in charge of the gathering were Howard L. Vanderberg, A. E. Staley Mfg. Co.; Alfred B. Perlick, Kalamazoo Vegetable Parchment Co. (chairman), and Fred B. Goodwill, St. Regis Paper Co.

Canadian Woods Meeting

Protection from forest fires was the topic of discussion at a two-day field meeting of the Woodlands Section, Canadian Pulp and Paper Association, held at Pine Lake Depot, Que., in June. Attending the gathering were 75 foresters, woods operating personnel, officials of federal and provincial government forest services, meterologists, members of forest protective associations, representatives of the pulp and paper industry, and some of its suppliers.

Of particular interest during the meeting was a demonstration of the use of the helicopter in fighting fires. Among the services performed by the helicopter in fighting fires are those of transport-

FIELD DAY COMMITTEE MEMBERS (l to r) Vanderberg, Perlick, and Goodwill

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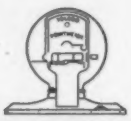

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HEADQUARTERS FOR SCALES

ing fire-fighting crews, reporting fire progress by radio, and bombing with water bombs.

The delegates also heard papers on various technical subjects, including long-range weather forecasting, developments in training fire crews, and scientific methods of suppressing fires. The meeting chairman was G. A. Kingston, manager of the Lower Ottawa Forest Protective Association.

Coming Events

TAPPI meetings

Sept. 19-21—Fundamental Research Conference, Institute of Paper Chemistry, Appleton, Wis. (jointly sponsored by TAPPI).

Sept. 26-28—Alkaline Pulping Conference, John Marshall Hotel, Richmond, Va.

Oct. 15-18—Sixth Engineering Conference of the Pulp and Paper Industry, General Oglethorpe Hotel, Wilmington Island, Savannah, Ga.

Superintendents Assoc. meetings

Sept. 6-8—New York-Canadian Division, Saranac Inn, Upper Saranac Lake, N.Y.

Sept. 14-15—Northwestern Division, Holiday Resort, Marinesco, Mich.

Sept. 14-15—Northeastern Division, Poland Spring House, Poland Spring, Maine.

Sept. 20—Michigan Division, Hotel Harris, Kalamazoo, Mich.

Sept. 28-29—Pennsylvania-New Jersey-Delaware Division, Pocono Manor, Pocono Manor, Pa.

Oct. 10-12—Southern and Southeastern Divisions (joint meeting), George Washington Hotel, Jacksonville, Fla.

Other meetings

Sept. 3-17—World Chemical Conclave (including meetings of the American Chemical Society, International Union of Pure and Applied Chemistry, and Congress of Pure and Applied Chemistry), Statler Hotel, New York, N.Y.

Sept. 10-14 — Sixth National Instrument Conference and Exhibit, Instrument Society of America, Sam Houston Coliseum, Houston, Texas.

Sept. 16-19—American Institute of Chemical Engineers, Hotel Sheraton, Rochester, N.Y. (national meeting).

Sept. 24-25—International Symposium on the Fundamental Chemistry of Cellulose, Pulp and Paper Research Institute of Canada, McGill University, Montreal, Que.

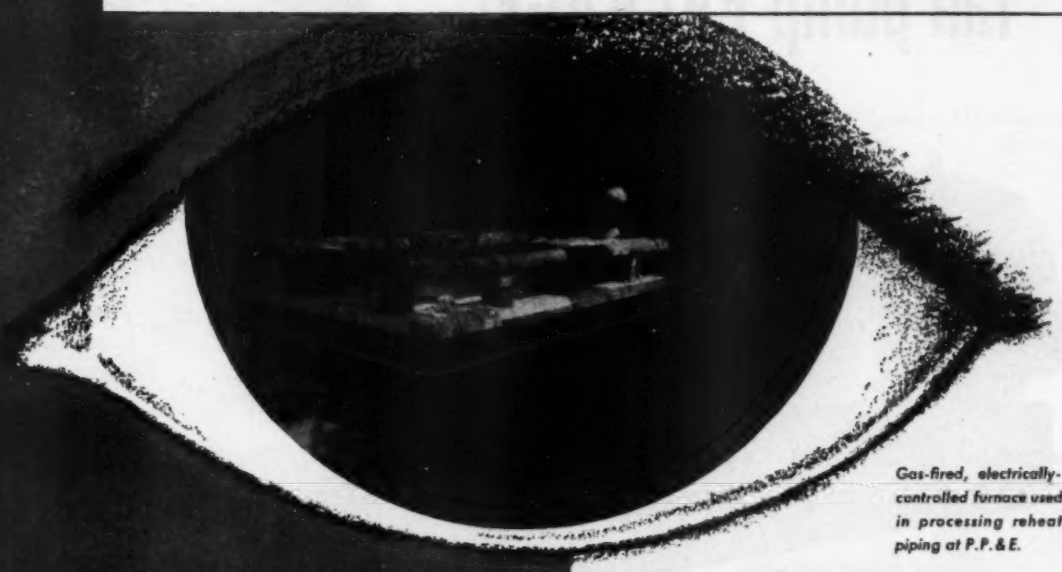
Oct. 1-4—Sixth Annual Industrial Packaging and Materials Handling Exposition, Society of Industrial Packaging and Handling Engineers, Cleveland Public Auditorium, Cleveland, Ohio.

Oct. 8-10—American Forestry Association and Society for the Protection of New Hampshire Forests, Jefferson, N.H. (annual meeting).

Oct. 8-12—National Safety Congress, National Safety Council, Stevens Hotel, Chicago.

Nov. 26-Dec. 1—23rd Exposition of Chemical Industries, Grand Central Palace, New York, N.Y.

Looking at REHEAT



Gas-fired, electrically-controlled furnace used in processing reheat piping at P.P.&E.

Through Experienced Eyes

Proper piping is essential in order to realize the benefits inherent in reheating steam to higher temperatures—increased volume per pound of water evaporated . . . reduced condensation in lines, casings, cylinders, etc. . . . improved BTU output . . . better fuel economy.

Remember when 750° F. was thought to be a high reheat temperature? Even then P.P.&E. was ahead of the needs in piping that would carry the load. As the trend toward higher temperatures continued, P.P.&E.'s experience accumulated.

That's why the conditions encountered in present-day reheat temperatures over 1000° F. are thoroughly understood by P. P. & E. engineers—and why adequate materials, design know-how, methods of treating and fabricating, and testing procedures are available.

Look to Pittsburgh Piping and Equipment Company for the experience, and the leadership in methods that assure greatest safety, highest efficiency, and longest service from high temperature, high pressure piping.

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Expansion Bends	Welding Fittings
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Worthington-built all-bronze fan pump with 300 hp, 700 rpm, 9.8 P.F. synchronous motor and magnetic drive in an Eastern paper mill.

You get *more* when you have your fan pump requirements filled by Worthington because:

1. A specialized pump application division set up *exclusively* for the paper industry is put at your service.

2. The unequalled experience of Worthington engineers (we're the world's largest manufacturer of pumps) gives you the benefit of the very latest engineering.

3. Your pump will be built exactly to your particular requirements.

4. The pump, the motor and variable speed drive (magnetic) are integrated into a single unit matched to your job.

So . . . for proper matching of drive and load, lowest cost of power, and complete assurance of an accurate flow to the head box regardless of conditions encountered, turn the job over to Worthington.

As well as fan pumps up to 50,000 gpm, we make a complete range of special pumps for the paper industry. Whatever your pumping problem—send your maximum and minimum requirements to Worthington because *there's more worth in Worthington*. Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, New Jersey.

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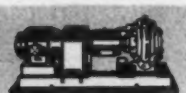

CENTRIFUGAL STOCK PUMPS
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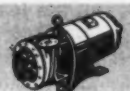


GENERAL PURPOSE PUMPS
Type DN. Single stage. Sizes 1 in. to 6 in. Capacities up to 2400 gpm; heads to 390 ft.

BOILER FEED PUMPS
Capacities up to 3000 gpm; pressures to 1250 psi.

The Paper Industry Names in the News

Central Paper Co. Names E. A. Charlton President

E. A. Charlton was recently elected president of the Central Paper Co., Inc., Muskegon, Mich. He will retain his post as general manager of the firm. At the same time *John G. Turnbull,* retiring president, was named chairman of the board of directors; and *R. D. Terrien* was made vice president and treasurer.

Joining the firm in 1950, Mr. Charlton was elected executive vice president and general manager that same year. He has served in official and executive capacities with many of the prominent firms in the paper industry in both the United States and Canada. Mr. Turnbull has been associated with Central Paper for more than 20 years, while Mr. Terrien has been with the firm 23 years.

Sorg Promotes Four

Four technicians have been promoted to newly created positions in the management group by Sorg Paper Co., Middletown, Ohio.

Donald G. Goodman was named technical superintendent of paper manufacturing. Appointed to positions as technical assistants to the superintendents of the three Sorg mills were *Richard J. Krueger,* Smith mill; *Leslie G. McCowan,* Sorg mill, and *John F. Nolan,* Oglesby mill.

Huyck Executive Resigns

Dr. Edwin A. Rees, director of felt sales and a member of the board of directors of F. C. Huyck & Sons, Rensselaer, N. Y., resigned recently. In announcing the resignation, Grenville R. Holden, president of the firm, said Dr. Rees will continue with the company as a consultant on papermakers' felt problems.

A graduate of the University of Illinois, Dr. Rees joined Huyck & Sons in 1920 as a research chemist. He later organized the first research laboratory of its kind in the felt industry. He pioneered the field service work on felts and water removal in the early days of high speed newsprint manufacture in Canada. He is widely known as the author of the *Kenwood Bulletins,* which were published for the paper industry in the 1920s, and has frequently presented papers on technical subjects at TAPPI conventions both in the United States and Canada.

Walker Hamilton Named Riegel Paper President

Walker Hamilton has been elected president of Riegel Paper Corp., New York, N.Y. The announcement was made recently by the firm's board of directors.

Mr. Hamilton joined the organization in 1921 and has been executive vice president and general manager since 1945. He succeeds John L. Riegel, who has been president since 1936 and who will continue to serve as principal executive officer as chairman of the board.

Calvin F. Lloyd

John J. Hain

Calvin F. Lloyd, assistant secretary and assistant treasurer of the Gardner Board and Carton Co., Middletown, Ohio, has been named to succeed *John J. Hain* as treasurer. Mr. Hain is retiring after serving the company since 1920. Mr. Lloyd joined the firm in 1930 as a cost clerk.

Ernest Perrigo, Carthage, N. Y., has been made superintendent of the Carthage kraft mill of St. Regis Paper Co. He succeeds *Wells Forbes,* who retired May 1 after 35 years of service with the firm. Mr. Perrigo, also a 35-year veteran, has been assistant superintendent since 1948.

Hyster Co. of Portland, Ore., has announced two promotions at its Peoria, Ill., plant. *Paul M. Fischer,* plant manager since 1940, has been advanced to the post of chief methods engineer with headquarters in Portland. Succeeding Mr. Fischer is *W. H. (Bert) Neptun,* who moves up from the position of assistant factory manager.

Besse Merrithew has resigned from the editorial staff of THE PAPER INDUSTRY after nearly 25 years of service with Fritz Publications, Inc.

Gerpheide Leaves Hawthorne

Hawthorne Paper Co., Kalamazoo, Mich., has announced that George H. Gerpheide has resigned as consultant to the sales organization. Mr. Gerpheide was president of the firm until its sale to William Slavin in 1950.

In announcing his resignation Mr. Gerpheide declared that he hopes to remain in the paper industry or in an affiliated line, although he has not as yet made definite plans. He is well known in both the production of fine papers and in executive work.

Robyn A. Campbell

James V. Otness

Robyn A. Campbell and *James V. Otness* have been named sales manager and assistant sales manager respectively of the paper division of the Minnesota & Ontario Paper Co., Minneapolis. Mr. Campbell was formerly assistant sales manager responsible for the field sales organization, while Mr. Otness has been manager of the Chicago sales office.

Merritt W. McGahan has been named research assistant to the Research Foundation of the State University of New York. He will work on chemical debarking studies recently initiated at the school's college of forestry, Syracuse. Mr. McGahan was graduated from the University of California and will receive his Ph. D. there in 1951.

Paul F. Dickmeyer, secretary and assistant controller of the Fort Wayne (Ind.) Corrugated Paper Co., has been elected to membership in the Controllers Institute.

Charles L. Campbell has been appointed chief engineer for the Centrifix Corp., Cleveland. A chemical engineer, he began his career in 1920 with the West Virginia Pulp & Paper Co.

E. A. Murray has succeeded *Herman H. Miller* as manager of the Compressor Division of the Worthington Pump and Machinery Corp., Buffalo, N. Y. Mr. Miller will act as consultant to his successor until his retirement at the end of this year.

Leslie Ricketts has been appointed administrative assistant of the Lockport Felt Co., Lockport, N. Y.

Dr. Edward G. Locke, formerly chief of the Forest Utilization Service in the Pacific Northwest Forest and Range Experiment Station in Portland, Ore., has been transferred to the U. S. Forest Products Laboratory, Madison, Wis. He will be chief of the division of derived products, which conducts research in wood chemistry. From 1942 to 1944 Dr. Locke was in the resource and development division of the Bonneville Power Administration. He is past national president of the Forest Products Research Society.

De Laval Steam Turbine Co. announces four executive promotions. *James P. Stewart*, former executive vice president, was made president; *Wencel A. Neumann, Jr.*, was elected vice president in charge of industrial sales; *H. G. Bauer*, previously vice president and executive engineer, was named vice president of engineering, and *Charles A. Jurgensen* was elected vice president of manufacturing.

Eugene S. Massey has been made technical sales representative in Cleveland for the synthetics department of the Hercules Powder Co., Wilmington, Del. He will assist W. W. Trowell, manager of the Cleveland office. Mr. Massey joined the firm last year.

S. E. Williams, former resident manager at Three Rivers, Que., for the St. Lawrence Paper Mills Co., Ltd., has been named general manager of the firm and its subsidiary, the Lake St. John Power & Paper Co., Ltd. He replaces *A. George Jacques*, who has resigned due to ill health.

S. T. Newton has been named sales manager of the Memphis, Tenn., division of Bemis Bros. Bag Co. He has been with the firm as a salesman since 1946.

Charles G. Catlin has been made general manager of the Allied Paper Bag Corp., Baltimore. He will be in charge of all phases of the company's operations.

H. O. Parrent, sales representative of Bemis Bros. Bag Co. at Phoenix, Ariz., has been appointed sales manager of the firm's Los Angeles plant.

Dr. John H. Truesdail has been appointed technical service manager of Olin Products Co., Inc., New York, N. Y., a newly formed company responsible for the sale and distribution of Olin Cellophane, the commercial production of which is to begin in the fall. Dr. Truesdail is the former technical superintendent of the film department of E. I. du Pont de Nemours Co. at Old Hickory, Tenn.

Dr. J. H. Truesdail

H. J. Dauphinee

Howard J. Dauphinee has joined the valve sales staff of Jenkins Bros., New York, N. Y. He will be located in the firm's San Francisco office. Before joining Jenkins Bros., Mr. Dauphinee headed export sales for the Enterprise Engine & Machinery Co.

Dr. Verne L. Harper has been named assistant chief of the Forest Service in charge of research. Before assuming his new post, he was director of the Northeastern Forest Experiment Station in Upper Darby, Pa. Dr. Harper, who joined the service in 1927, will coordinate all research activities.

Russell D. Scribner has been made production manager of the folding carton division of Robert Gair Co., Inc., New York, N. Y. Prior to his association with the Gair Co., he was in charge of four plants of Shellmar Products Corp., Mt. Vernon, Ohio, and had been for 15 years in the cellophane division of the Du Pont Co.

Kay Crabtree, resident manager of the Crabtree, Que., mills of Howard Smith Paper Mills, Ltd., has retired after 46 years of continuous service. He began his papermaking career at the age of 14, later becoming mill superintendent at a mill built by his father near Joliette. He was mill manager when the firm was bought by the Howard Smith Co. and held that position until his retirement.

Frank M. Small has been appointed Montreal branch manager for National Paper Goods Ltd., Hamilton.

James H. Diehl was recently made chief of the Division of Cooperative Forest Protection in the U. S. Forest Service. In his new post, he is in charge of Forest Service participation in the state-federal cooperative program to protect publicly and privately owned forest lands against fire. During the past four years he has represented the Forest Service in all state and private forestry work in the Middle West. His headquarters were at Milwaukee.

General Electric Co. has announced four assignments at its Fractional Horsepower Motor Engineering Divisions at Fort Wayne, Ind. *J. Herbert Behm* has been made assistant to the manager of engineering on special assignments; *Lee R. Beard* was appointed division engigineer of the AC Motor Engineering Division; *Ray D. Jones* has been named division engineer of the Development Engineering Division, and *I. E. Ross* was appointed division engineer of the DC and Specialty Motor Engineering Division.

Alaska Pine & Cellulose Ltd., Vancouver, B. C., has elected *Leon J. Koerner* president; *D. W. Ambridge*, chairman of the board; *Walter C. Koerner*, vice president and managing director; *R. R. Keay*, comptroller, and *G. I. Draeske*, secretary.

Gair Co. Canada Ltd., Toronto, has announced three appointments from within the firm. *W. George Cowan*, manager of the folding carton and container divisions was elected vice president, a director, and assistant to the president. *Alpine L. Mitchell*, general sales manager, was made vice president in charge of sales and a director. *J. Stanley Babbitt*, who joined the Montreal mill as manager 15 years ago, was appointed vice president in charge of Montreal operations and was made a director.

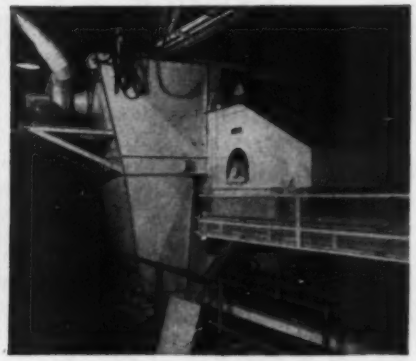
Falk Corp., Milwaukee, announces three appointments in its sales staff. *Rodger J. Mueller* has been made manager of the Youngstown, Ohio, office. Succeeding Mr. Mueller in the Pittsburgh office is *D. B. Bodholt*. *D. R. O'Hare* has been appointed assistant in the Philadelphia office.

Albert A. Halley has been appointed sales manager of the industrial and commercial department of the Industrial Tape Corp., New Brunswick, N. J.

Denman F. Jacobson has been named assistant manager of the New York Industrial District of the Scott Paper Co.

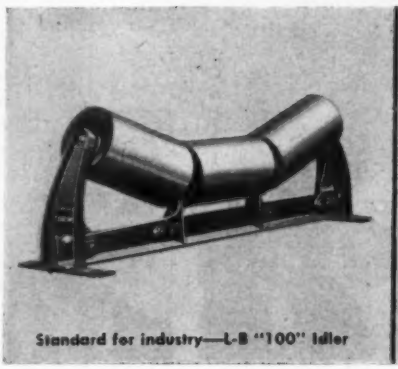
LINK-BELT engineering experience...

Modern pulp mill equipped with reliable, efficient Link-Belt Feeders and Belt Conveyors.



Link-Belt Conveyor and Traveling Tripper handling 240 tons of wood chips per hour.

LINK-BELT quality components...



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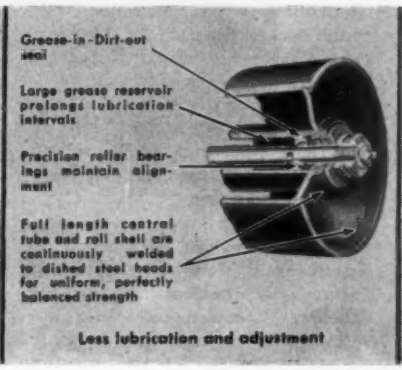
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The Paper Industry Necrology

Dr. Harry P. Brown

One of the great teachers in American forestry, *Dr. Harry P. Brown* died May 24 while at work at the State University of New York's College of Forestry, Syracuse. He was 64.

An eminent wood technologist, Dr. Brown had been a professor since 1913. A native of West Winfield, N.Y., he received his doctor's degree from Cornell University in 1914. Before joining the state forestry college staff he had been a xylotomist for the U. S Forestry Service and a botany instructor at Cornell. Many leading researchers, teachers and industry men were numbered among his former students. He was the senior author with A. J. Panshin and C. C. Forsaith of the two-volume "Textbook of Wood Technology," published in 1949.

Dr. Brown was a member of the Society of American Foresters, serving as chairman of the New York Section in 1932-34. He was also a member of its national committee on tree nomenclature. In addition, Dr. Brown was affiliated with the American Association for the Advancement of Science and the Botanical Society of America. Surviving are his wife, Helen, a son, and two daughters.

Mrs. Olive Florida Eminger

Well known and loved throughout the paper industry, Mrs. Olive Florida Eminger died July 9 at Dayton, Ohio. Her home for the past 45 years had been at Miamisburg. She was 76.

Mrs. Eminger was the wife of Robert L. Eminger, who for 20 years was secretary of the American Pulp and Paper Mill Superintendents Association. He retired in May of 1944. Attending every annual meeting of the association except one during her husband's term of office, Mrs. Eminger became widely known to mill executives throughout the country.

Surviving in addition to the husband are one sister, a brother, four nieces and two nephews. Services were held in Miamisburg July 12.

Otis Bascom King

Manager of manufacturing since 1944 for the container division of the International Paper Co., *Otis Bascom King* died July 2 at his home in Croton-on-Hudson, N. Y. He was 41.

Associated with International since 1933, Mr. King was assigned to the Southern Kraft Division in the southern mills. He was a graduate of the United States Naval Academy at Annapolis and had served with the War Production Board during World War II. He is survived by his wife and two sons.

George E. Williamson

A veteran of the paper industry who had risen through the ranks, *George E. Williamson,* 72, president and board chairman of Strathmore Paper Co., West Springfield, Mass., died July 3 while in Des Moines, Iowa, on business.

Born in Worcester, Mass., Mr. Williamson was a graduate of Worcester Tech. After completing a year of post graduate study, he began his career as a tour worker for the American Writing Paper Co., Holyoke, in 1902. He was later connected with Union Metallic Cartridge Co., Bridgeport, Conn., as a chemist and engineer.

Mr. Williamson joined Strathmore in 1911 as chief engineer. He served successively as assistant to the president, treasurer, vice president, and president-chairman. He was named president in 1946.

A vice president of the American Paper and Pulp Association, he was president of Premoid Products, Inc., West Springfield, and was a director of the Rising Paper Co., the Old Colony Envelope Co., the Springfield National Bank, and the Manufacturers' Fire Insurance Co.

Active in the Eastern States Exposition, Mr. Williamson served as vice president of that organization. He was also honorary president of the Hampden County Improvement League and a director and former president of the Springfield YMCA. A member of the executive committee of the Writing Paper Manufacturers' Association, he was also active in Masonic and church activities.

Services were held July 6 at the Faith Congregational Church in Springfield.

Ralph H. Kehl

Director of industrial relations for Kimberly-Clark Corp. since last December, *Ralph H. Kehl* died July 18 as the result of an automobile accident near Hortonville, Wis.

Mr. Kehl had been associated with the firm since 1932. He began as an engineer and later was transferred to Niagara Falls as personnel superintendent of the company's mill there. He returned to Neenah in 1944 as manager of the Badger-Globe mill. He became assistant to the general superintendent of the corporation in 1946. Immediately prior to his appointment as director of industrial relations Mr. Kehl was head of the manpower division.

Charles Whitney Morden

A veteran of 40 years in the paper industry, Charles Whitney Morden, president of Morden Machines Co., died in his Portland, Ore., home July 23. He was 63.

Mr. Morden began his career in 1911 with the Crown Willamette Paper Co. and at one time was assistant resident manager of their Portland office. In 1927 he began the development of stock preparation equipment for pulp and paper mills and in 1931 founded the Morden Co.

Surviving are the wife, Ada, and a son, R. Burke Morden, vice president of the firm.

C. W. Morden

Elmer F. Sommer

Elmer F. Sommer, 48, sales engineer for Beloit Iron Works, Beloit, Wis., died suddenly July 6 while playing golf. A native of Beloit, he had been associated with the firm 32 years. For ten years Mr. Sommer had been chief of the service department before entering sales.

John Maurice Wolfe, 38, president of Wolfe Paper Box Co., San Carlos, Cal., was killed in an automobile accident near Redwood City July 12.

Al Cosby, sales representative for Whiting Co., Inc., Holyoke, Mass., died suddenly at his Holyoke home recently. Prior to his joining Whiting he had been associated with American Writing Paper Corp. 26 years.

Joseph J. Mulchaey, veteran general superintendent of the Flambeau Paper Co., died at Park Falls, Wis., June 21. Following his retirement a few years ago Mr. Mulchaey had served as a paper consultant.

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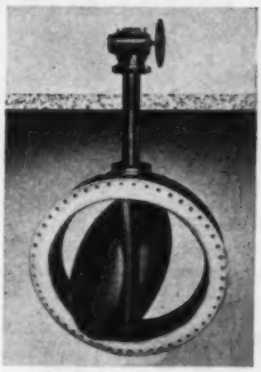

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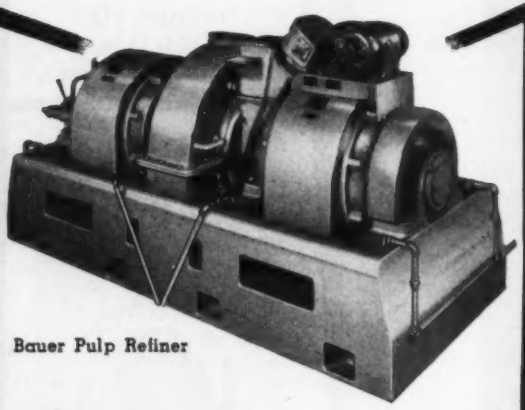

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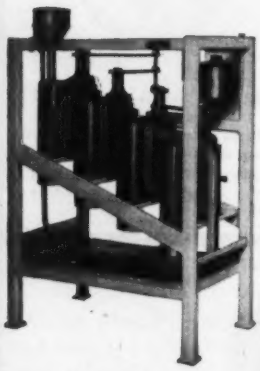

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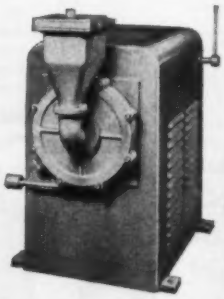

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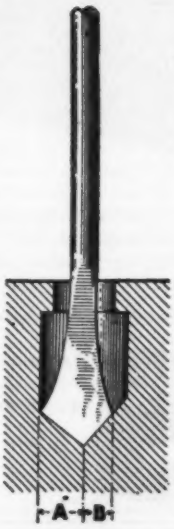
The Paper Industry Practical Shorts

Some Valuable Drilling Tricks

If you have no twist drill of a size you need, it is not difficult to make one out of drill rod steel. You can make one in any size in the manner as shown in the sketch herewith. Heat the end red hot and hammer out flat, as pictured. Then cut, grind, harden, and temper. Thus for example if you want to drill a half-inch hole the dimension A should be one-fourth of an inch. For best performance the dimension B should be equal to A so that the point will be exactly in the middle.



By making B less than A, as shown in the sketch, it is possible to make the bottom of the hole greater in diameter than the top of the hole, as indicated. The diameter of the hole will always be twice the greater radius, which in this instance is A.

As for cutting angles, the best way to get them right is to mimic the best practice. That is, make the cutting angles and edges the same as those you find on your standard drills.—W. F. SCHAPHORST, M.E.

Double layer insulation gives safer, more effective service

Application of molded insulation in two layers instead of a single layer of equivalent thickness results in a more efficient and, where a fire hazard is present, a safer installation.

Expansion and contraction of high temperature equipment often causes joints between insulation blocks or sections to open. Enough heat can escape through these cracks to materially reduce the effectiveness of the installation. Furthermore, the canvas or cement finish around the joint area may become sufficiently scorched to require repair or replacement.

Open joints are particularly dangerous in a fire hazard area, such as a refinery where a leak or break in an adjacent pipeline or vessel would allow escape of a flammable liquid. In a Southwestern refinery enough heat escaped from the open joints of the insulation on a pipeline to ignite some oil-soaked materials left temporarily on the line. Canvas jacket of a high pressure steam line in a large central station power plant on the East coast was ignited by the heat escaping from the open insulation joints.

Double layer insulation permits the use of staggered joints and prevents these troubles. After the first layer is wired on, the sections or blocks in the second layer are applied so that each joint is centered over a block or section underneath. If the joints in the inner layer should open, the outer layer acts as an effective heat seal. In this way, there is no path of heat escape from the equipment surface to the outside.—THE MAGNESIA INSULATION MANUFACTURERS ASSOCIATION.

Do You Know These Facts About Repair Parts of Machines?

Instead of trying to make your own repair parts, it is usually more economical and better in every way to buy them from the manufacturer of the machine needing repairing. In special emergencies it may be excusable to hire a neighboring mechanic to make a repair part for you, but, the chances are that the part won't fit as well as would a part purchased from the maker of the machine. As a result the machine will give less efficient service, its usefulness will be impaired, and the reputation of the manufacturer may be injured for no fault of his own.

Consider, for example, a part as simple as a brass bushing appears to be. Many mechanics think they can make bushings as capably as can the manufacturer himself, but the truth is that they cannot. The manufacture of a finished bronze bushing is a specialized job. Many years of experience, and much skill are required to make bushings right. The same is true of bearings and many other parts made of special alloys. It is safe to say that 99 times in 100, in this day of special metals, the home-made product is made of the wrong material.

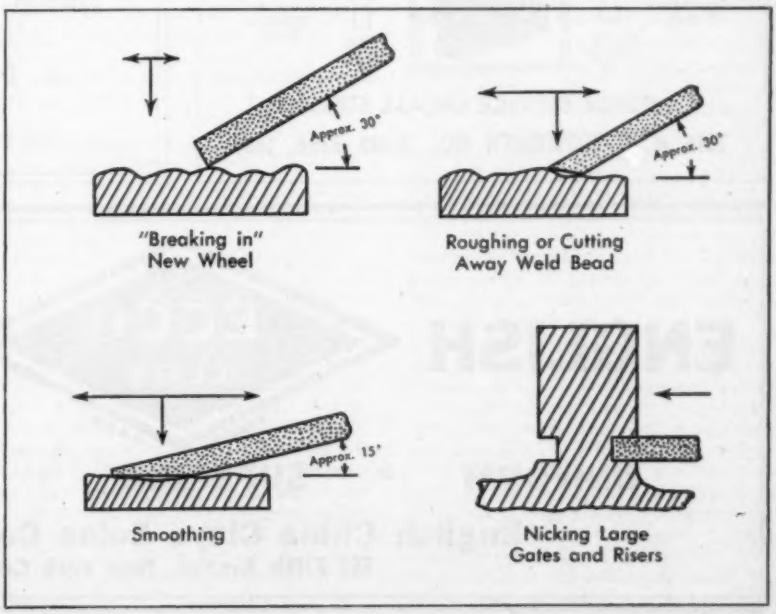
Also, when buying machinery, it is usually best to buy standard machinery rather than something "special." If the machine is standard the manufacturer can supply you with repair parts at less expense and more quickly than if the machine is special. W. F. SCHAPHORST, M. E.

Breaking In and Grinding on Welds

For best results, a newly mounted wheel should first be applied to the weld at about a 30 deg. angle to the work surface and with sufficient pressure to break down the corner of the wheel and develop a flat face for grinding. For *rough grinding* the weld, apply sufficient pressure so that the leading edge cuts away the weld as it moves forward. At the same time rock the wheel slightly.

For *smoothing* the weld, tip the wheel down to an angle of about 15 deg. to the work surface and sweep it back and forth over the weld. To obtain maximum cutting efficiency, it is important to apply sufficient pressure to utilize the full power of the grinder.

As the wheel wears down, a fringe may sometimes remain from the composition safety web on the back. Should this become objectionable, it can be readily trimmed off by simply holding the back edge of the wheel against the work for an instant or by holding a coarse dressing stick against the back edge.—From *Grits and Grinds*, published by the Norton Co., Worcester, Mass.



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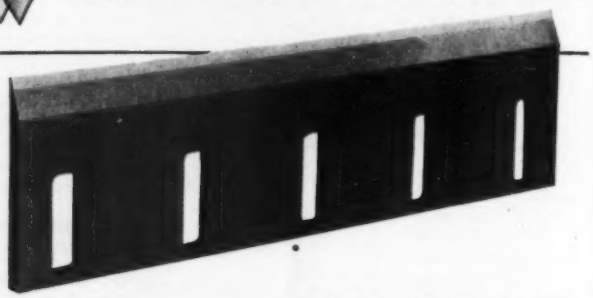

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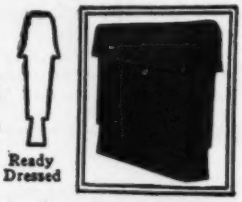

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Foreign Abstracts . . . . . .

Reactivity of cellulose to acetylation

A new method is described for determining the reactivity of a cellulose (or pulp) in acetylation. The method is based on the measurement of electrical conductance in an acetylation mixture containing as solvent, methylene chloride (in place of acetic acid). In such a mixture, the acetic acid formed during the esterification greatly increases the conductance of the system. A change in conductance is also caused by the acetylated fibers as they swell and dissolve in the acetylation mixture. The rate of change of conductance during the acetylation may be used as a measure of the reactivity of the cellulose—or the velocity of the acetylation process. Thus a reactive cellulose will cause a rapid increase of the conductance, while a much slower increase will be noted with an unreactive sample. The apparatus used is shown in Figure 1. The acetylation mixture contains 40 grams acetic anhydride, 80 grams methylene chloride and 0.2 gram sulphuric acid. The ratio of cellulose to this mixture was 1 to 24.

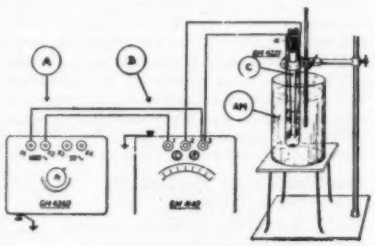

Fig. 1—Arrangement for measuring the electrical conductance during acetylation. (A) is the 1000-cycle oscillator, (B) a Wheatstone bridge, (C) the conductance cell, and (AM) the acetylation mixture.

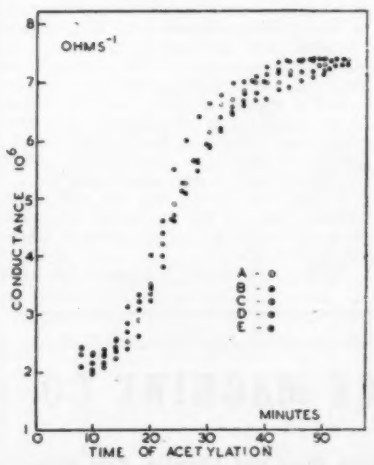

Fig. 2—Accuracy of the conductance method. A, B, C, D and E represent five different acetylations, but of the same cellulose.

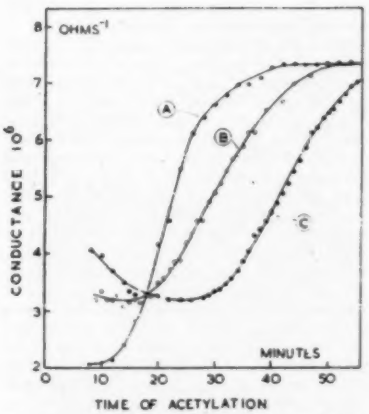

Fig. 3—Reactivity of different celluloses. (A) is a wood cellulose especially manufactured for acetylation, (B) is a wood cellulose of extremely high content of alpha-cellulose, suited for cellulose acetate, but of a lower reactivity than (A), and (C) is cotton linters, acetate type.

Experiments were carried out at 40 C. and measurements were made between 10 minutes and 1 hour (when the change of conductance is nearly proportional to the time). The sensitivity and accuracy of the method is fully discussed. Reproducibility of a determination is shown in Figure 2 (where a pulp sample has been acetylated in 5 different experiments). Figure 3 shows the reactivities of three different celluloses. (*A*, contains 95.9%, *B* contains 97%, and *C* contains 99.5% alpha-cellulose). The method gives results which are in good agreement with those of other procedures. The application, influence of drying temperatures on reactivity, and the effects of pretreatment on rate of acetylation are fully discussed. Karl Borgin *Norsk Skogindustri* 5, No. 3 69-74 (1951) (In English).

Odor elimination in a sulphate mill

As the result of legal difficulties arising from the odors of the kraft mill of Vita Mayer and Company, the authors studied atmospheric pollution in relation to the location of the plant and meteorological conditions, as well as the odors in the neighboring Olona River (produced by discharge from digesters and evaporators). Various analyses are given for methyl mercaptan in relief gases during digestion and from the blow at the end of the cook, in the condensate from the gases (which are treated for the recovery of by-products such as turpentine *et al*), in the gases from condensers of the multiple-effect evaporators, and from the disc evaporator; in gases at the base and at the top of the stack.

Hydrogen sulphide was also determined in a number of these cases, and an overall interpretation of the analytical data indicate that all values are very much higher than those previously reported in the literature. Thus, per ton of pulp, the mercaptan discharge from the chimney was 4 kg. and the hydrogen sulphide discharge was 9.5 kilos. The waste waters apparently contained 2.3 kg. methyl mercaptan per ton of pulp.

It is suggested that odors in the waters could be destroyed with waste hypochlorite from the bleach plant. To remove odorous substances from the gases, the authors propose that the disc evaporator be replaced by special multiple effect evaporators, that an electrical precipitater be installed, that chlorine be introduced in the washing tower (using waste from the bleach plant), and that a tall stack be built which would serve to release the fumes at a height of 50-70 meters above the onrmal terrain. The authors give 12 tables, 4 figures and 28 literature references. Gino Bozza and Piero Colombo. *Chimica e Industria* (Milan) 31, 233-61 (1941); through *Bull. Inst. Paper Chem.* 21, No. 8, 530-31 (Original in Italian).

Pinewood lignin as a ceramic deflocculant

"Lignin" recovered from kraft black liquor has been used in ceramic deflocculation in typical semivitreous and hard porcelain casting bodies. Percentages as low as 0.4% of the sodium lignin derivative make it possible to reduce the water content of the test semivitreous casting body from 60% to 35.4%. Similarly, the water content of the hard porcelain casting body was reduced from about 59% down to 40%. Using pinewood lignin a desired fluidity can be reached with less sodium than is required (for an equal fluidity) with an inorganic deflocculant. The pinewood lignin apparently has a greater deflocculating action on kaolins than on ball clays. The authors give 12 tables and 3 references. L. R. Lawson, Jr. and J. J. Keilen. *Am. Ceram. Soc. Bull.* 30, No. 4, 143-7 (1951).

Pulpstone grit distribution and groundwood quality control

A comparison was made between the general performance and operating characteristics of pulpstones which had approximately the same grain (grit) size. These were two artificial (Crystolon) pulpstones: a single grit (60 grit) stone (I), and a multiple grit (II) (average grit = 69) pulpstone. For the specific newsprint operation in the mill known to the author, I gave more pulp (freeness for freeness), and showed a more uniform performance than did II. The stock produced was of high quality. The study does not prove that I *invariably* performs more satisfactorily than II.

Many multiple grit combinations are possible, and only a few have actually been studied. However, from experience gained to date, the single grit stones are a step towards improved pulp quality. A pulpstone with multiple "72 grit" was also used in some of these experiments. However, here the burst and tear of the resulting groundwood were often relatively low, and the pulp was rated as poorer in quality. Eight tables and nine diagrams are included. E. P. Walsh. *Pulp & Paper Magazine Canada* 52, No. 4, 76-81; 86 (1951).

Superintendents Meet on West Coast

Abridgments of technical papers—Continued from page 530

els, the nozzle positioning and control equipment has been greatly simplified. At the present time, Sumner Iron is building a very large unit for installation at the Weyerhaeuser saw mill in Everett to bark up to 42-ft. long and 84" diameter logs. The practicability of handling long logs in this type of barker has often been debated, but the results of the Everett installation will establish the actual facts.

The Bellingham barker is one of the simplest and most trouble-free barkers. Against the Ring and Simons barkers, it has the disadvantage that the jets are idle for an unloading and loading period. However, the over-all efficiency of the barker is good.

At the Crown Zellerbach mill in Port Angeles, the cutter head on the Stetson-Ross barker was replaced by an oscillating nozzle which directs a stream of water against the bark face of 500 at 1200 p.s.i. At first, the oscillating mechanism gave considerable trouble, but this has now been re-designed and the operation is very satisfactory. The machine has a capacity of 8,000 to 11,000. While it is obviously desirable to bark logs before breaking them down, on installations such as this where most of the wood has to be broken down for the grinders, the conversion of a mechanical barker to hydraulic offers tremendous wood saving at a moderate cost.

An interesting variation of the ring barker is the oscillating ring barker used on small wood at the Rayonier mill, Port Angeles. The barker has five nozzles set in a ring with their axes converging at the center. The ring oscillates through an arc of 80° so that the nozzle streams cover the entire log surface as it is fed through the center of the ring. The bark is effectively removed, but the barking efficiency is lower than the ring barker as it is not practical to oscillate the ring rapidly enough to achieve maximum jet efficiency. The main advantage of this barker is the relatively low cost as there is no sealing problem, the water being fed into the ring manifold through a swing pipe. Hence, it could be used in small saw mills where production rate is low and the first cost is of prime consideration.

Sulphite Pulps for a Specialty Mill

J. V. Savage, sulphite mill superintendent at the Camas, Wash., mill, Crown-Zellerbach Corp.

The Crown-Zellerbach mill at Camas, Wash., is able to furnish 20 pulp grades on 24-hour notice. The mill has produced 623 grades of paper during the past year. Through such a program the mill has found that when the desired paper characteristics are taken into consideration at the mills much can be gained in paper machine speed, stock preparation, and in minimizing required stock preparation equipment.

A total of 20 different grades, including kraft and groundwood, are made up of pulp that has been cooked differently in the digesters or has been handled differently in the bleach plant, or a combination of both. The mill has seven wood species and varying percentages of mixtures of these.

In order to produce the greatest number of speciality orders, a pulp specification sheet is kept for each grade of paper. Each time a grade change is scheduled on the paper machine the specification sheet is checked for special instructions to the operators. In order to maintain efficiency and economy a combination of grades is scheduled so that each of the mill's 14 paper machines and one pulp dryer will be utilized. One man handles the schedule and breaks it down into individual pulp grades. He indicates on a form sheet such information as what time the various grades will be needed, in what chests the grades should be put, the number of pounds per hour, and the total number of tons required. The same man breaks the pulp supply schedule down farther by scheduling the exact time of day at which each cook should be started and what grade it is to be, and he also indicates exactly when a grade change is to be started in the bleach plants and at what rate of production. This information is made available for the guidance of those concerned.

Expediting the Packaging and Shipping of Paper

J. W. Weiblen, superintendent of finishing, Columbia River Paper Mills, Vancouver, Wash.

A considerable amount of labor is utilized in the process of paper finishing, and with the ever increasing cost of labor new and more efficient methods are sought to keep labor costs within sight. Unlike other departments, efficiency of individuals and methods dictate labor costs per ton. In a recent study we found loss of time to be as high as 40% in some steps.

Realizing a more efficient procedure would increase production and cut costs, we installed an assembly line that has doubled production per man hour. The increase has been made possible with the use of mechanized conveyors and air hoists placed in position with two trimmers.

A well organized system of paper work, as well as any necessary mechanical handling equipment, helps to expedite shipment of paper, as well as invoicing customer upon shipment.

Rotary Cutters

George Holt, general superintendent, Rayonier, Inc., Hoquiam, Wash.

Paper finishing rooms in general have presented an excellent opportunity for substantial reductions in per-ton costs. Although involving personnel to some extent, cost reduction depends largely on the use of improved cutting equipment. This has stimulated the use of rotary cutters. And the net result has been to make available machines that are far superior in quality, design and performance than those we have been accustomed to regard as satisfactory. Knife castings have been re-designed and are now built in circular form. Cutters are now in production that will run up to 700 feet per minute. Late model overlapping layboys are far ahead of standard delivery ends. New mechanisms have been developed to eliminate down-time caused by set changes. It is true that space factors govern the amount of equipment that can be installed to service a cutter, but in considering the use of double backstands it is probable that in most cases the extra production will reduce the required storage space for rolls behind the cutter.

How We Operate Our Supercalenders

R. W. Riley, superintendent of coated paper, Crown Zellerbach Corp., West Linn, Ore.

Supercalendering is a quality operation. The cost is balanced by the quality improvement that the customer wants and pays for. Supercalendering is not enough. Paper machine operation, coating operation, and supercalendering must all be closely coordinated. Supervision on this basis has proved desirable.

An educational program on these operations was started four years ago and is still continuing. Statistical quality control is used to check paper from both the paper machines and the supercalenders. Although not new, this testing procedure goes into more detail on coated, supercalender treated papers. It is used in the control of both operations on a reel to reel basis. More changes are required on the paper machines than on the supercalenders to control quality. A level sheet is one of the fundamentals of quality in supercalendered paper. In addition, adequate and uniform moisture contributes greatly to maximum quality.

Stabilization of Douglas Fir Kraft Black Liquor

H. W. Bialkowsky, research director, and Gerritt G. Dehaas, pulp division, Weyerhaeuser Timber Co., Longview, Wash.

The main sources of mill odors are the digester relief and blow gases, the vents from the evaporators, and the furnace stack. Organic sulfur compounds such as methyl mercaptan and di-methyl sulfide are produced as side reactions during the latter part of the pulping operations. Both methyl mercaptan and di-methyl sulfide have very high vapor pressures over the range of temperatures of normal pulping operations. The former is soluble in dilute alkali by virtue of its slightly acid nature, but under the conditions of relieving and blowing the digesters the fugacity of both of these sulfur compounds is extremely great, with the result that these compounds are volatilized almost completely during digester relief and blow and during the initial phases of subsequent evaporation.

In the pulping of Douglas fir we have

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found organic sulfur losses ranging from 1 to 5 pounds of sulfur per ton, depending upon the pulping conditions. These materials are partially condensed and appear in the digester relief and blow condensate, and in the evaporator condensate and the balance appears in the non-condensable gases and escapes to the atmosphere. The recovery furnaces, coupled with direct contact evaporators, are the primary source of hydrogen sulfide with relatively small amounts of organic sulfur compounds which eventually pass up the stack. The hydrogen sulfide losses from the direct contact evaporators and furnaces are closely related to the residual sodium sulfide in the black liquor going to the recovery operations. Depending upon the residual sulfide ion concentration, these losses can be relatively great, in the range of 35 pounds of sulfur per ton of pulp producer. On a weight basis, therefore, the hydrogen sulfide losses from the recovery operation are of much greater magnitude than the organic sulfur compound losses from digestion.

Black liquor oxidation

The purpose of the stabilization treatment by oxidation is to convert the residual sulfide to some more stable form of sulfur so that liberation and loss cannot occur.

It was necessary to establish in the laboratory the conditions necessary for complete oxidation of the sulfide ion and to determine the effect of this stabilization in a treatment similar to direct contact evaporation.

A laboratory tower consisted essentially of two 8 foot long concentric glass tubes. The inner tube was enclosed in a water jacket to establish constant temperature conditions. The air and liquor were passed through the tower at pre-determined rates and the black liquor flowed continuously along the inner wall of the inner tube. The air entering the tower was preheated and humidified by bubbling through the water in the water jacket. The black liquor was kept under nitrogen in order to prevent additional oxidation. The air flowing con-currently with the liquid was taken off at the side of the bottom of the tower.

While there are many combinations of air flow, liquid flow, and surface area possible in order to arrive at complete sulfide ion removal, these tests indicate that under normal conditions 1000 sq. ft. of packing surface will handle 10 pounds of sulfide ion per hour and at 3 gms. per liter the liquid flow should be 400 gallons per hour per 1000 sq. feet with a gas flow of 10,000 cu. ft. per hour. The laboratory experiments showed that excessive foaming of the black liquor could be prevented.

A laboratory Cascade test was developed wherein a small amount of black liquor was treated with nitrogen gases containing either sulfur dioxide or carbon dioxide.

The effect of the air oxidation or stabilization treatment is reasonably well demonstrated by these tests. However, it is apparent that the hydrogen sulfide development is eliminated as long as the temperature does not exceed the boiling point of water. When the temperature increases to around 250° C. some hydrogen sulfide is split off from the black liquor in spite of the fact that the black liquor did not contain any residual sodium sulfide. These results seem to indicate that a reduction of the hydrogen sulfide losses can be expected as far as the direct contact evaporation is concerned, but that when there is any localized over-heating in the evaporators and during the final combustion in the furnace there can still be some hydrogen sulfide generated from the organic sulfur compounds.

Some experiments were also carried out in the laboratory towers to determine the

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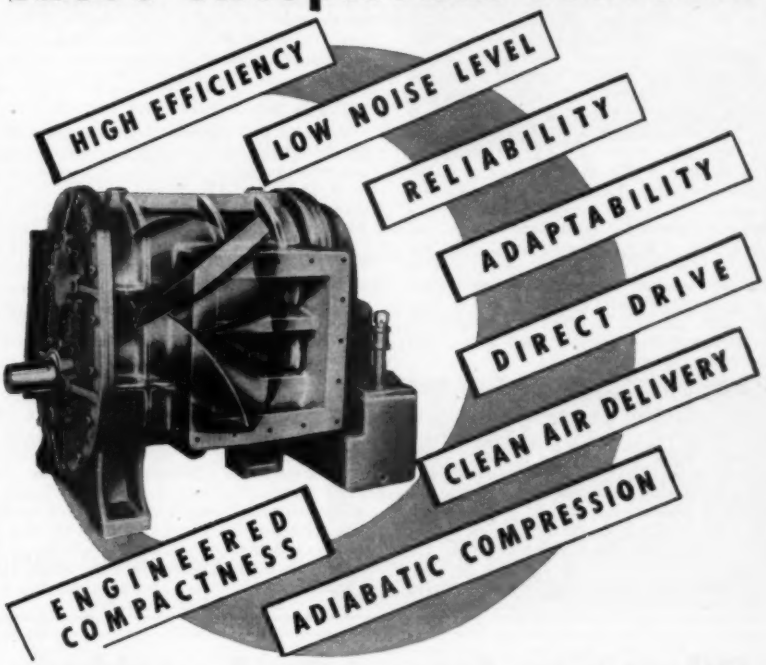

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possibility of oxidizing foul compounds from the relief and blow such as hydrogen sulfide, mercaptan and dimethyl sulfide in the presence of black liquor. The object of these experiments was to mix the foul compounds with the air ahead of the oxidation tower and to dispose of them by an oxidation treatment. Separate tests were made on hydrogen sulfide, mercaptan, and dimethyl sulfide in concentrations of 6 mg. per liter of the entering air.

As expected, most of the hydrogen sulfide was absorbed in the alkaline black liquor and was oxidized along with the residual sulfide ion in the black liquor. No hydrogen sulfide was detected in the air leaving the tower. In the case of methyl mercaptan, 5% of the original material passed through the tower unchanged and 40% of the material left the tower as dimethyl disulfide. The balance of the material was probably absorbed in the black liquor as dimethyl disulfide. It is very probable that this latter material would be stripped from the black liquor during evaporation. In the case of dimethyl sulfide over 90% of this material passed through the tower unchanged. It appears, therefore, that it does not seem practical to effect a simultaneous oxidation of foul digester gases along with the black liquor.

Pilot plant investigations

The pilot plant tower was made of stainless steel with a diameter of 40 in., and a packed height of 18 feet. The tower was packed with 3 in. cross partition rings having a total effective surface of 5750 sq. ft. The installation consisted of a fan for the air, a black liquor pump and a black liquor sump with adequate instrumentation for measuring the air and liquor flow.

Pilot plant experiments were modeled after the work on the laboratory tower. They show that when black liquor is oxidized on a pilot plant scale stabilization efficiencies similar to the small tower can be obtained. In experiment No. 3 the efficiency was 97% with a black liquor flow of 29.9 gal./min. with an oxidation of 3.2 gms. of sodium sulfide per liter. This corresponds to 42 gms. of sodium sulfide per hour per square meter which is in the same range as the values obtained in the small glass tower. The conditions of both towers are essentially the same except that with the larger tower there is a greater chance of incomplete wetting of the entire active surface.

Mill scale test

A plant size tower was then erected to handle 300 gallons of black liquor per minute, with an incoming sulfide concentration of 3 gms. lt. The tower was 10 ft. in diameter and 30 feet high and packed with 22 feet of 4" cross partition rings. This gave an effective surface of 50,000 sq. ft. The black liquor was pumped from the storage tank to a distributing arrangement on the tile at the top of the tower. The black liquor overflowed the sump at the bottom into a secondary sump and returned to a second storage tank. The air was forced into the tower at the top and passed out at a vent line from the sump at the bottom of the tower. This installation was also equipped with adequate instrumentation for measuring the air and liquor flows.

As there was a relatively large amount of black liquor inventory in the storage tanks, evaporators and Cascade evaporators, it took a considerable length of time until the Cascade evaporators and furnaces could be operated on liquor containing only traces of residual sulfide ion. During this period numerous experiments were conducted to establish the proper air flow in relation to the liquor flow to attain complete oxidation under plant operating conditions. Approximately 10 cu. ft. of air per minute were used for each gallon per minute of liquor flow. No serious foaming troubles were encountered. Tests were also made on the air leaving the oxidation tower. No hydrogen sulfide could be detected.

The plant where the mill scale tower was erected normally operated with a sulfidity of 16 per cent and in order to maintain the sulfidity, it was customary to add approximately 3000 lb. of elemental sulfur per day to the digesters for the production of 170 tons of pulp per day. As the oxidation tests progressed it was possible to completely eliminate the addition of elemental sulfur to the digester and the sulfidity of the cooking liquor increased from 16 per cent to around 20 per cent. No foaming difficulties were encountered and it was possible to attain complete oxidation of the liquor with an average flow rate of around 295 gpm.

To check the action of the Cascade evaporators on the stabilized liquor, flue gas analyses were made after the furnace and after the Cascade evaporators. Tests made on normal liquor before stabilization showed average values of 0.5 mg. of hydrogen sulfide per liter of gas after the furnace, and 1 mg. of hydrogen sulfide per liter after the Cascade evaporators. The volume of flue gases is approximately 3½ million cu. ft. per hour. The addition of elemental sulfur to the cooking liquor in the digesters was first reduced by 50 per cent and then stopped completely.

As soon as the black liquor oxidation unit was put into operation, analyses of the black liquor and the flue gases were continuously carried out. During the first 4 days the sodium sulfide in the black liquor entering the tower was completely oxidized. Beginning with the 5th day a small amount of residual sodium sulfide appeared in the oxidized black liquor but this originated from by-passing the tower with liquor that could not be handled in the tower. In other words, the tower handled only about 300 gallons per minute and the production rate was over this amount, with the added amount going directly to the second storage tank.

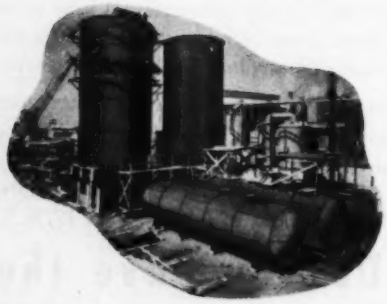
The average sulfidity during the week before starting the oxidation unit amounted to 16.6 per cent. After the 3rd day the average sulfidity increased to 19.3 per cent with only a slight increase in salt cake consumption. From the second day until the 8th day the average hydrogen sulfide of the gas after the furnace and after the Cascade evaporators was 0.390 mg. per lt. and 0.389 mg. per lt. respectively compared with 0.5 mg. per lt. and 1.0 mg. per lt. under normal conditions. These data show a significant reduction of the hydrogen sulfide losses as far as the Cascade evaporator is concerned and confirmed the results of the laboratory Cascade tests which indicated that the hydrogen sulfide development in the Cascade evaporator should be eliminated by the black liquor oxidation.

Sulphur loss reduced

The reduction of the amount of sulfur lost as hydrogen sulfide calculated from the flue gas flow and gas analysis appeared to be of the same order of magnitude as the 3000 lbs. of sulfur per day actually saved, or 18 lbs. of sulfur per ton of unbleached pulp. In addition, the sulfidity increased from 16 per cent to 20 per cent.

As already mentioned, in the operation of these oxidation towers, no serious foam difficulties were encountered. However, every effort was made to reduce foaming ten-

When you have a tank problem



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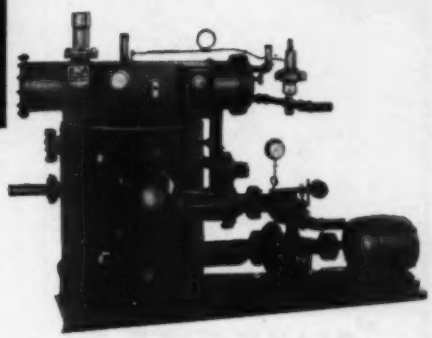

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dencies to a minimum. The distribution of the liquor in the tower was such as to obtain good wetting with a minimum of splashing and the liquor and air were passed through the tower in the same direction and the flows adjusted to minimize regurgitation. The treated liquor was collected in a sump at the bottom of the tower and flowed by gravity to a secondary sump. The levels in these sumps were carefully adjusted so that the flow of the liquid broke and stabilized the foam at the liquid surface. When these liquid levels are not properly balanced very large quantities of foam can be produced. The foam difficulties were eliminated completely for 7 to 8 months of continuous operation.

The stabilization of the black liquor resulted in a marked saving in sulfur and a marked reduction in air pollution, which was readily noticeable in the area surrounding the plant. However, the mill is not odor free, since this treatment does not effect a reduction or elimination of the mercaptans and organic sulfur compounds originating from the digester relief and blow.

Supervisory Development—Don't Tell 'em 'til You Ask 'em

Robert Boaz, director, Personnel Development Service, Seattle

In honestly attempting to remedy costly and inefficient situations in the plant many superintendents commit psychological blunders that only add to the difficulty. By "getting out the whip" and merely announcing that the situation will be corrected the superintendent usually causes employee resentment.

No matter how good the superintendent's ideas, they won't take hold in the mill and show up on efficiency ratings unless they can be applied. And for an idea to be applied the employee must have a clear and complete understanding of it. Sometimes a man will reject an idea merely because he hasn't understood it. Voluntary acceptance depends upon complete understanding.

In a situation that is simple and inherently clear the superintendent cannot be expected to take time in detailed explanation. He has the right to give direct orders. But, in situations where plant production, overall efficiency or high accident rates are involved the superintendent and top management will save time in the long run if they first explain the situation, then request cooperation.

What We Have Done to Remain Competitive

Walter F. Wolfe, Supt., Mac-Sim-Bar Paper Co., Div. of United Biscuit Co. of America, Ostego, Mich.

Any company that has not kept pace with the industry as a whole will find itself unable to offer a product of proper quality at a competitive price and still make a fair profit.

The paperboard industry has been advancing very rapidly during the past few years. It has made many notable improvements in every phase of its business. Each of these improvements has been made for one or more of three reasons: to improve quality, to increase production of a salable product, or to reduce costs.

One of the first and most basic steps taken by the company with which I am connected was to increase the productivity of manpower by mechanizing wherever possible. We have greatly increased raw stock storage space, meaning a definite saving in at least two ways: first, a higher inventory can be carried, and second, the various grades of waste can be sorted more carefully.

The capacity of the beater room has been modernized and increased by replacing the filler beaters for one machine with a Hydrapulper; by installing cycling hydrating systems, and by otherwise rebuilding the room.

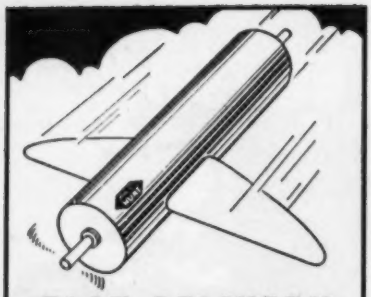
Several years ago we saw the necessity of being able to coat paperboard on the machines and installed the equipment necessary to do so. To avoid poor finish we tried unweighting our presses as much as possible, a practice which reduced machine speed. In order to overcome this fault, a smoothing press was installed just ahead of the second coating unit. In order to overcome the strong tendency of light coated board to cockle, it was necessary to locate the coaters as advantageously as possible, to make certain that the driers were as perfectly aligned as possible, and to eliminate all long draws.

To increase tonnage we increased machine speed and instituted a system of quality control. And, of course, we have tried to cut mechanical failure to a minimum and make repairs as easy as possible.

Screening Book Groundwood from Western Soft Woods

Arthur Palmer, groundwood mill superintendent, Crown Zellerbach Corp., West Linn, Ore.

The coarse thick fibres of Sitka spruce and white fir are not as adaptable to a higher grade book grade groundwood as the finer fibered Eastern woods. Problems encountered in both grinding and screening had to be worked out by trial and error. Briefly, it was found that best results depended on: the replacement of 60 grit Norton stones with 80 and 90 grit; frequent light sharpening



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with fine cut burrs, and screening through very fine screen plates.

The West Linn fine screens consist of 12 IMPCO's with Inconel plates. The fine perforations of these plates, .045 and .050, compare with the usual .065 and .075.

Factors which influence the efficient operation of a groundwood screen include: mechanical condition, uniform volume and consistency, adequate power, shower water, and screen plates. It should be emphasized that these light gauge plates require a solid backing.

Metal Allocations

L. E. Hill, Jr., plant engineer, Weyerhaeuser Timber Co., pulp division, Everett, Wash.

Industrial freedom of development is now restricted by shortages of metals. These arise in part from developments already in process, which obligate large quantities of material; in part from added demands to supply high level economy, and in part from depletion of ore deposits or restriction of trade.

These factors restrict free use of steel, tungsten, cobalt, copper, aluminum, nickel, and almost every other alloying element. A dog-eat-dog purchasing scramble would upset production of military supplies. Therefore, application of controls was necessary. This took form as a system of single level defense order priorities.

The needs of one industry have affect on the operations of other industries. For instance, in papermaking production is dependent on the ability of wire weavers to obtain material for fourdrinier wires and cylinder mold coverings. The American Pulp and Paper Association has submitted a brief to the National Production Authority outlining the necessity for full allocation if full production is desired. Included was the quantity of material needed, as well as the amount of salvage that would return to the metal trade after such wires were worn beyond further paper mill use. The problems handled in this manner must of necessity be of industry-wide application. The individual hardship case must be worked out by the particular mill involved.

Industry advisory groups working with NPA try to avoid arbitrary decisions harmful to essential production. The single level priority system breaks down when too many claims are recognized, as by allowance for maintenance, operation and repair requirements.

Limited application of the Controlled Materials Plan will be started in the third quarter. When operating, defense production will be assured necessary steel, copper, and aluminum. Essential civilian production is also included, but alert use of substitute materials will be necessary. The difficult job faced by management can be alleviated by frank disclosures from the government on pending plans.

Stainless High Alloy Steels—Current Developments Affecting the Pulp and Paper Industry

J. M. Wilcox and James T. Gow, Electric Steel Foundry, Portland, Ore.

The designations of the American Iron and Steel Institute for the various grades and types of high alloy steels are those most commonly used. Those in the 300 series are the iron-chromium-nickel grades; those in the 400 series are mostly the straight iron-chromium types of stainless steels, with variations in carbon content and small additions of other elements, but—except for a couple of special grades—without any nickel; those in the 500 series are relatively low alloy steels, more closely comparable to the SAE types and not usually classified as true stainless steels by the true definition.

Of great importance to the pulp and paper industry are the molybdenum-containing stainless steels. The United States normally contributes about 90% of the world's molybdenum production.

A rather recent metallurgical development has helped to alleviate the shortage of stainless steel. In brief, it is that of the use of oxygen gas in electric furnace stainless steel melting operations.

The steel industry as a whole is strongly urging the use of substitute grades of alloy steels in order to preserve those elements that are in short supply or allocation. For example, the alkaline process pulp mills use Type 302 or Type 304 18-8 grades of stainless steel for the bulk of their requirements such as evaporator tubing, paper machine save-all pans, stainless-clad storage tanks, rust-resistant applications, etc. To the best of our knowledge, there are none of these applications in which a straight chromium grade of stainless steel such as Type 430 (17% chromium) would not be quite satisfactory from the corrosion standpoint.

In the sulphite acid pulping process Types 316 and 317 grades of stainless steel containing molybdenum have been used successfully for those applications encountering the severest corrosion. Unfortunately, there is as yet no known substitute for molybdenum that will produce the same corrosion-resistant qualities. Stainless steel Type 329 (containing approximately 26% chromium, 3½% nickel, and 1½% molybdenum) has been suggested as a substitute, but only as a means of conserving the existing supply of nickel and molybdenum. Before the advent of the molybdenum-bearing grades of stainless steel, straight chrome-nickel grades were used with fair success in the sulphite pulp mills. It would be the best substitute if molybdenum were completely unavailable.

The somewhat new extra-low carbon-content stainless steels are finding increased use in the sulphite mills and the chemical industries in general. The ELC steels were developed for two principal purposes: (1) to be of use in equipment that would be field welded or hot formed without subsequently being heat treated to dissolve the carbides that were formed during such heat exposures, and (2) to be used in fabricated equipment that is required to be stress relieved and withstand severe corrosion conditions.

In other grades of low alloy steels for non-corrosive applications, such as heavy duty machinery parts, the substitution of such elements as vanadium and titanium for molybdenum will give entirely satisfactory properties. Where fabricated stainless steel pipes are expendable or unobtainable because of plate and sheet shortages, we can suggest the substitution of centrifugally cast stainless steel pipe that, generally speaking, will have a longer service life, although it is sometimes more expensive.

Preliminary Refining of Hot Stock Kraft

Gordon Petrie, sales engineer, Black Clawson Co., Portland, Ore.

One solution to the problem of attaining a higher pulp yield economically is the use of pretreatment equipment. Devices have been developed that reduce cook time and chemical costs and prepare fibers uniformly for wash stages. Extensive research in conical refiner filling design has produced excellent commercial results.

A completely enclosed system that eliminates any foam troubles is one of the outstanding advantages of the Shartle-pressure type hot stock refining installation. Another

advantage is that it holds the plug setting constant, contributing to long filling life.

Stock Preparation in Board Mills

Lee E. Eberhardt, Bauer Bros. Co., Springfield, Ohio

Modern revolving disk mills are new in stock preparation applications. The preferred conditions and optimum procedures for many potential users are only sketchily understood and appreciated. But in the short time that such mills have been employed in refining pulp and waste papers for paper and board manufacture, they have shown distinct merit. Because of the great flexibility of treatment provided by the many controllable factors, such as speed, plate design, consistency, etc., these mills promise to become a very important tool for stock preparation in the immediate future.

Acceptance of disk mills in all fields of stock preparation is due to: (1) traditional equipment is inadequate to efficiently produce grades of paper and board of a quality demanded by the trade in a transition period in which there is a continual quality degradation of pulp and waste paper available for conversion; (2) the trend in other very efficient industries is toward continuous processing, and applying equipment that will eliminate traditional inefficiencies, and (3) the disk mill provides certain pulp qualities and unique effects, in addition to strength development, that are desirable. The disk mill provides very little cutting of fibre when compared to a bar knife action refiner.

Several generalizations about the two types of disk mills can be made: (1) Slow speed single disk mills do more mullen strength development with less defiberizing or deshiving than high speed single or double mills at the same power input; (2) in one pass through the machine double disk mills defiberize uniformly and completely such materials as cooked chips, uncooked chips, and screen rejects; (3) double disk mills completely fiberize and disperse fibers in pulp suspensions such as Breaker beater stock of pulp lap or waste papers, and (4) double disk mills resemble colloid mills in their dispersing action.

Our scientific knowledge of fibres and of the effect of mechanical treatment on pulp is too meager to serve as a basis of choosing the equipment best suited to a specific job. Among the variables are the number of rotating disks, rate of power application, rotation speed, feed consistency, pattern of fiberizing plates, distance between plates, and precision of construction.

The most efficient treatment of waste paper is one involving the maximum of violent agitation with the minimum of bar to bar cutting action. This effect can best be achieved with a double disk refiner operating at 1,200 RPM with the plates operating at a clearance up to 1.000 inches.

Disk mills have found excellent acceptance in the field of deinking waste papers. Disk mill refining produces a deinked defibered stock of uniform color, free of "ink balls," with the finely divided ink and dirt completely dispersed.

The symposium, "Deinking of Printed Papers" appeared in *Paper Industry and Paper World* in June, 1949, and covered the field thoroughly.

Operation and Maintenance of Lime Sludge Kilns

W. H. Tock, engineer, Basic Industries Department, Allis-Chalmers Mfg. Co., Milwaukee

It is of prime importance to give care and consideration to the operation and maintenance of lime sludge recovery kilns to avoid costly chemical waste and disruption of balanced operation.

The primary purpose of the rotary kiln is to reburn an otherwise waste product, lime sludge, continuously producing a high quality lime at a uniform rate on an economical basis with a minimum of equipment maintenance.

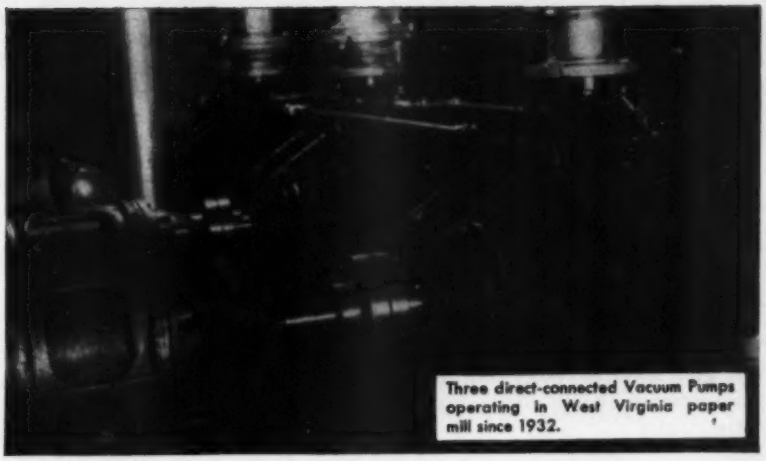
Many factors are involved in attaining optimum process operation. In many mills difficulty has been encountered in feeding the kiln at a uniform rate of lime sludge. This difficulty is due primarily to the inability to deliver sludge to the filter at a uniform and constant rate. Sludge may be controlled through various means. Some of these methods have been by use of a controlled pump, weir and weir-box, cake thickness gauge, and ferris-wheel feeder.

While there may be a control of volume of mud to a filter or centrifuge, it does not necessarily mean that the rotary kiln will receive a constant volume of cake per kiln revolution. Controls must be applied to insure a controlled flow or constant delivery of mud of uniform consistency to the filter or centrifuge.

Fluctuations in consistency that lead to irregularities in the volume of sludge feed to the kiln per kiln revolution will be reflected in erratic kiln operation.

This is brought out by the fact that the kiln may be divided into three zones: the drying zone, which is the feed end of the kiln; the intermediate or preheating zone; and the calcining or burning zone. Any change or variation in the moisture content or amount of cake fed to the kiln per kiln revolution will upset operation or balance in all zones.

Variations in moisture content before and


Three direct-connected Vacuum Pumps operating in West Virginia paper mill since 1932.

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1. **LOW POWER CONSUMPTION**—because units are recommended, either single or compound, to operate at the most efficient point.
2. **NEGLIGIBLE FRICTION LOSSES**—no contact between impellers or impellers and casings.
3. **HIGHER SPEEDS**—permitting direct connection to standard motors, saving first cost, space and weight.
4. **FLEXIBILITY**—to meet varying demands; suction automatically overcomes resistance in system.
5. **DEPENDABILITY**—long-time, attention-free operation, due to simplified design and construction.

For many years, R-C Vacuum Pumps and related equipment have proved profitable investments for paper mills of any size. Bulletin 50-B-13 sent on request.

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Here are three film sets that will help you arouse and keep alive interest in your safety program. And there is no better way to teach foremen how to be better supervisors.

SPEAKING OF SAFETY

A brand new set of films that will teach your foremen and supervisors the tips they should know about making safety talks, and how to transmit management's ideas and plans. Six 35mm sound slidefilms and leader's manual in an attractive leatherette case.

HUMAN FACTORS IN SAFETY

This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

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A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

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NATIONAL SAFETY COUNCIL

425 North Michigan Ave., Chicago 11, Illinois

after the centrifuge and variations in the volume of sludge to the kiln per kiln revolution with the correspondent continual adjustment of kiln speed of fuel flow also can promote the formation of coatings, rings, or large balls.

Moisture critical

Lime from most kilns is discharged in the form of dust-free pellets; and a number of factors contribute to this product form. Among these factors are the moisture content of the feed to the kiln, uniformity of volume of feed per kiln revolution, the analysis of the feed, disintegrating action of the chains on the cake, and the rolling action of the sludge on the kiln wall.

In chain system equipped kilns, the lime sludge as discharged from the chain system should have a moisture content of from 10 to 15% for best operation. At this moisture content, the chain system is protected by the sludge against the disintegrating effect of the high-temperature oxidizing gases entering the system. The temperature of these gases is approximately 1200 to 1400° F.

This pelletized form of the lime sludge will be retained through the preheating and calcining zones unless it is caused to further agglomerate by the presence of excessive impurities, particularly soda, in the sludge. Impurities can be controlled by proper liquor clarification, washing, and filtering. With respect to proper pellet formation and maintenance of this pellet form without additional agglomeration, coating, or ring build-up, experience indicates that for most operations, or average operation, the soda content as Na_2O should be maintained at approximately 1% of the dry weight of the sludge with the free lime content maintained constant at about 5/10%.

Samples should be obtained from sample holes located ahead of the chain system, both just inside the discharge end of the chain system and just outside the chain system, to evaluate reduction in moisture content and to obtain some visual picture as to what pellet formation is taking place.

In the event the sludge leaving the chain system has a moisture content of less than approximately 10 to 15% and the sludge sample appears to be breaking up to a dusty form, removal of a portion of the chain should correct this condition. Conversely, if the material sample appears to have constant moisture, considerably above the 10 to 15%, the addition of more chains would be indicated to accomplish further drying.

The condition of the feed is a major factor in controlling the formation of over-size pellets or large balls. In the formation of these over-size pellets or large balls, more heat is required for average calcination. The outside of these lumps may be over-burned with the center core under-burned, all resulting in a low availability in the kiln product.

A high soda content in the sludge is the greatest contributing factor to the formation of large balls and rings within the kiln. With increasing soda content in the sludge, there is a reduction in the fusion temperature of the material within the kiln with which there might be an accompanying ring formation or agglomeration of charge to the lining in all three zones of the kiln. High soda content usually has a deleterious effect on kiln linings, particularly in the hot zone, materially shortening brick life.

However, dam rings, a hanging up in the chain system, or a back-spill of feed may occur in some kilns even though the soda content is held to a possible minimum below 1%. A change in moisture content of the sludge feed may correct these objectionable effects.

To correct persistent ring formation in any of the three zones, particularly in the chain system or to overcome a back-spilling effect which is usually caused by the inability of the lime sludge to feed into the chain system, it may be necessary to further change the feed to better control the impurities.

In these cases, attempts to overcome back-spilling involved the extension of spirals to the feed head, thinning of the chain system in the feed end portion, the elimination of some of the chains in the feed end portion of the chain system, and the elimination of lining in the feed end portion of the kiln between the feed head and the start of the chain system.

With respect to ring formation, all other factors equal, small diameter kilns seem more prone to ring formation, particularly in the burning zone, than do larger diameter kilns. The reason for this tendency can be the greater arch effect inside a small kiln, giving better retention of a ring formation in place against the lining. The smaller arch effect of the large diameter kilns will tend to cause agglomerating materials to fall away from the lining during kiln rotation, thus minimizing ring formation. A periodic coating in the burning zone of the kiln usually can be removed by shifting the fire zone or stopping the fire for a short period of time, or by barring. I do not know of any adverse coating in the hot zone of any lime sludge kiln requiring a shut down to dig out such coating.

Considering ring formation or build-up throughout the kiln, particularly in the chain system but also in the pre-heating section and the calcining section, sometimes a change in kiln speed or a change in the burning conditions can be employed in an attempt to overcome these problems.

Combustion control

In addition to controlled feed, the combustion of the fuel is of utmost importance in uniform kiln operation. For controlled combustion for any given rate of feed with given moisture content, temperatures must be held uniform and the draft at the firing hood must be held constant. This control can be accomplished through the use of a few essential instruments, the most important of which is the draft controller. The draft controller will operate either through the draft obtained at the firing hood to regulate the damper on the outlet of the exhaust fan or in the stack base to maintain this draft at the desired value for best operation. The usual draft at the firing hood will range from 0 to .05 inch water column.

To properly record, interpret, and control the kiln operation, there should be available to the kiln operator a record of the feed end gas temperature, the burning zone temperature, the rate of fuel flow, and the draft at the feed end of the kiln and at the firing hood. Additional thermocouples can be installed along the kiln to obtain the gas temperature at any given point.

In addition, an instrument finding more and more use is the oxygen analyzer. It is used to determine the oxygen content of the kiln flue gases as an aid to evaluation of proper combustion conditions. Using this analysis, the operator can balance the combustion conditions within the kiln consistent with efficient fuel consumption and best overall operation of the kiln.

An oxygen analyzer, which analyzes a sample of the gases withdrawn from the feed end of the kiln, can operate to give an accurate analysis of gas conditions only, providing adequate attention is given to the sampling device to insure the withdrawal of a representative sample. The greatest trouble encountered with the operation of the oxygen analyzing equipment is in maintaining a clean sampling tube. Provisions must be made to provide for the periodic cleaning of this sampling tube, either by removal

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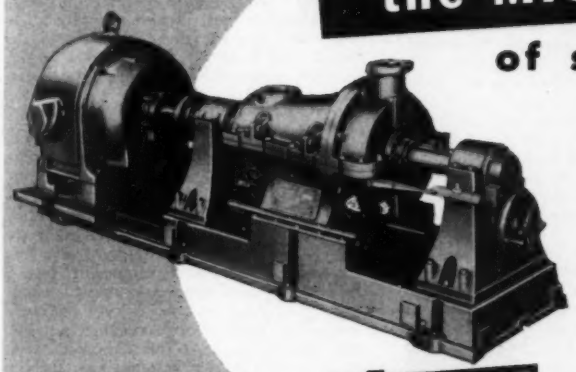

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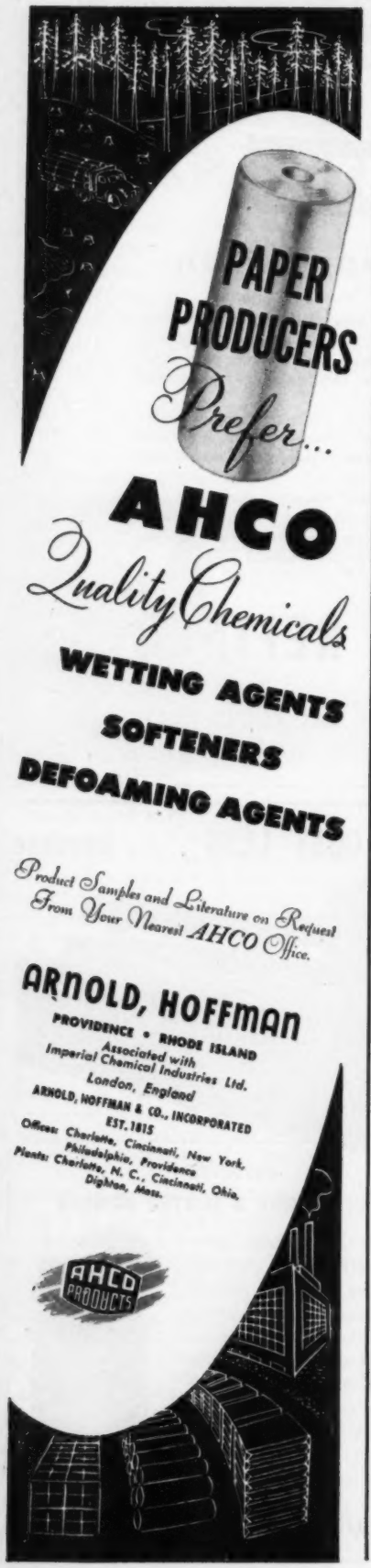


from the kiln or by blowing with air or flushing with water.

All instruments and operating controllers should be mounted on a central control board or cubicle located on the burning floor convenient to the kiln operator. The control panel should also include all necessary gauges, ammeters, voltmeters, and motor starter push button station.

Mechanical maintenance

The continuity of operation of a lime sludge kiln requires strict maintenance control. The rotary kiln is among the largest type of moving machines made and is subjected to extreme temperatures, power stoppages, atmospheric and weather conditions, varying loads, and other operating conditions which affect its wear and alignment. It should be erected following a procedure precisely as outlined by the kiln manufacturer, or it should be installed under the supervision of the manufacturer's erecting engineer.

It is assumed that in the initial installation, the kiln is aligned perfectly with the kiln riding rings exactly between the centers of the carrying roller bearings. It is likewise assumed that there is a full bearing between the faces of the riding rings and rollers.

Heavy localized loadings leading to adverse wear can be encountered if the rollers and riding rings do not bear across their full width of face or if the rollers are cut excessively.

The carrying mechanisms are equipped with screw lugs for roller and bearing adjustment. Rollers can be adjusted correctly through these screw lugs and the adjustment checked by inserting lead wires between the riding ring and rollers when they are rotating and measuring the thickness of the lead wire after it is pressed. In this manner, the rollers can be adjusted to obtain full bearing across the face. Adjustments must be performed carefully to avoid excessive pressure and wear from developing on any one particular roller tire combination.

The thrust rollers are designed to carry the full downhill thrust of the kiln with the riding ring and roller faces lined up for full bearing across the width. However, carrying rollers should be cut slightly to cause the kiln to float away from the downhill thrust roller for at least a portion of each revolution to avoid the possibility of an excessive down-hill thrust existing which might be detrimental to the thrust roller. Even while there is apparently an equal force between the rollers and riding rings, there might be an excessive down-hill thrust due to slight inaccuracies in the surfaces of the carrying rollers and riding rings, or due to conditions which may have resulted from unequal loading in the kiln or warping of the shell in operation.

In aligning the kiln by adjusting or cutting the rollers, all rollers should be cut an equal amount rather than take all of the cut on one set of rollers. If one set of rollers only is cut to move the kiln in one direction, it is possible that another set of rollers could be cut to move the kiln in the opposite direction should the first correction be excessive. Such action continued would only lead to the various sets of rollers working against each other. If this action is carried to extremes, excessive misalignment could occur between any one set of rollers and the corresponding riding rings, thus resulting in unequal and aggravated wear between the riding ring and roller surfaces.

Stopping a kiln with hot charge, such as through a power failure, with no rotation of the kiln within a short while thereafter, can lead to a warped kiln or a distorted kiln shell. It is difficult to return a warped shell to its original condition; and operating a kiln in a bowed or warped condition will throw an adverse excessive load on the various mechanism piers. This is particularly troublesome in multiple-support kilns; in two-support kilns, there is also aggravated bearing conditions between the riding rings and rollers.

Sometimes, a warped kiln can be returned to somewhat its original alignment by properly reheating the kiln on the opposite side from the warp to draw it back in line. Even at best, though, constant attention must then be given to the carrying mechanisms to provide an alignment which will not cause additional damage or adverse wear.

Warped kiln

Sometimes, the only way in which to correct a warped or bowed condition or misaligned shell is to cut out a portion of the shell, then reline the riding rings and carrying rollers, and finally weld the shell section back in. This job might result in a slightly disjointed shell alignment; but, at least, the items of major importance; namely, the riding rings and rollers, are realigned.

The best method of proceeding is to take steps in the original installation to avoid such trouble. Use a gasoline engine as an auxiliary drive to rotate the kiln at a slow rate of speed during power failure. For any type of kiln, either a two-support kiln or multiple-support kiln, the auxiliary drive is definitely good insurance. It can be provided at a small additional cost on the initial installation.

In the modern installation, the main or girth gear, usually a spur gear, is made in halves with full-machined teeth to permit reversing of the gear to obtain a double life. The main gear is bolted to a gear ring flange which, in turn, is welded to the kiln shell. The main driving pinion meshes with the main gear and is keyed to the low speed shaft of an enclosed gear reducer. The gear reducer is fixed to the foundation on the same slope as the kiln. The more recently installed reducers are provided with adjusting bolts and lugs on the reducer base plates to provide for adjustment or alignment of the drive. The driving motor is usually connected to the high speed shaft of the gear reducer by a multiple V-belt drive.

Present trend seems to be toward kilns having a greater slenderness ratio than formerly—that is, a greater ratio of length to diameter. With higher speeds of recent years, we have encountered (or at least been made aware of a condition which did exist previously) a kiln-vibrational problem.

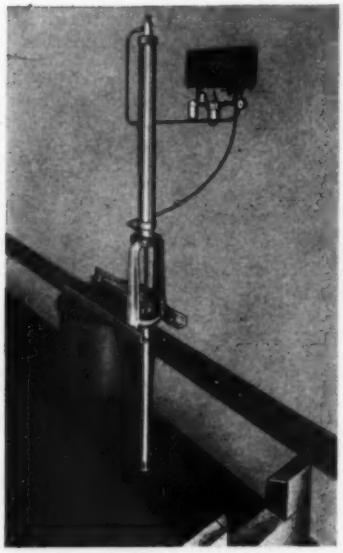
Large slow moving equipment, such as the rotary kiln, has a low frequency of vibration, which, in many cases could and has coincided with a kiln speed in the operating range. When this occurs, we obtain a definite pronounced torsional effect which is reflected in an actual bouncing of the kiln on the supporting rollers and a knocking and pounding effect in the main gear and the gear reducer. If such an effect were left to continue, it would result in damage to the foundation and the kiln parts.

The usual method of driving the main pinion has been to mount it directly on the reducer-extended low-speed shaft held in an outboard bearing.

By utilizing the proper flexible coupling, installing it between the reducer low-speed shaft and a jackshaft mounting the pinion, we can drop the critical speed below the operating range, nullifying the otherwise detrimental effects of vibration.

The matter of critical speed and its effect on operation should be investigated thoroughly when deciding to increase kiln speed in an attempt to increase kiln capacity.

Your key to stream-pollution problems and to process-loss conservation



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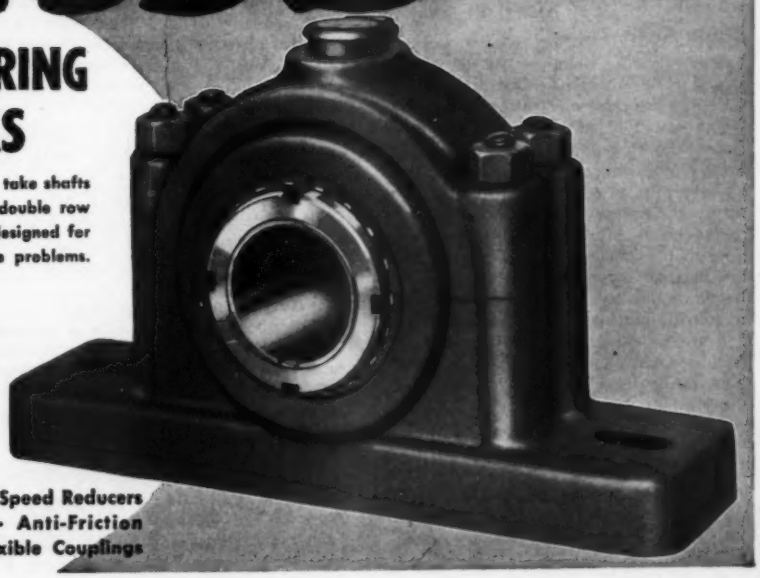

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Collapsible Drum

Available in limited quantities for essential uses in the chemical and petroleum fields, a new 55-gallon drum, is made of synthetic rubber-fabric and can be collapsed after emptying. When collapsed, more than 2,500 of these drums can be shipped in a standard railroad box car that would hold only 300 conventional rigid drums.

It is made of Ustex cord fabric, a low stretch cotton textile, impregnated with synthetic rubber and molded in one piece. It is equipped with simple fittings for filling, emptying, lifting and handling. When being filled, it requires no venting, and liquids that oxidize easily can be withheld from exposure to air during removal from the drum.

Experimental tests by the manufacturer indicate that the new drum will be suitable for oils, greases, fats, acids, paints, emulsions, soaps, dry powders and a variety of industrial chemicals. United States Rubber Co., Rockefeller Center, New York 20, N.Y.

Chain Saw

A new gasoline chain saw, Model 26LCS, is said to be "a one-man saw that does the work of a two-man saw." Fast cutting speed is the result of two unique features: a narrow-kerf Homelite chain which does less waste cutting and thus requires less power to drive, plus an efficient Gilmer belt drive which eliminates drive gears that eat up engine power. The weight of the saw is close to the operator's body, ensuring perfect balance. Simple pivot action and one simple control make for easy operation. Ball and needle bearings at every point of friction are provided for rough wear; and a built-in engine governor keeps the engine from racing when the saw is out of cut, and prevents excessive wear. Rain and dust proof ignition are also built in.

One-man straight blades are listed in 18-, 23-, and 30-inch sizes; two-man straight blades in 23-, 30-, and 42-inch sizes; bow saws, for one or two-man operation, in 19-, and 25-inch sizes. Homelite Corp., Port Chester, N. Y.

Rotating Clamp

A hydraulic paper roll clamp (capacity 2000 lb.) to be mounted on a 4000 lb. truck incorporates "wrist action" to give more maneuverability while the truck is stationary. When the clamp is in vertical position, wrist action makes it possible for the loads to be placed close together without jockeying the truck. When the clamp is horizontal, such jobs as picking up the second roll from a nested position are possible. Accurate high-tiering and load spotting become more feasible.

Rolls may vary in diameter from 24 to 48 in., and the clamp revolves 360 degrees in either direction. Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.

Rubber Patching

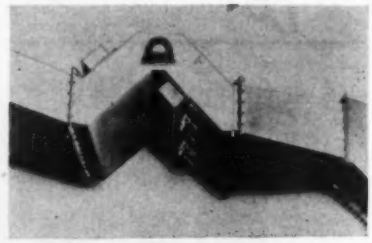
Carbo-Flex 6040 is a non-rubber base material that patches rubber linings and coatings in any application where rubber flexibility is not important. It bonds perfectly to used, vulcanized rubber, with only about .1 per cent shrinkage. Corrosion resistance and heat resistance are superior to that of rubber.

It is readily mixed for use and hardens at room temperature. Drying time is ordinarily two to three days, but this can be shortened to several hours with additional catalyst and/or application of heat by infra red lamps or warm circulating air. Shelf life of the material is indefinite. The completed patch can be tested with a spark tester, in the same manner as the original rubber lining. Test kits, with sufficient material to cover 60 sq. in. ⅛ in. thick, and with primer for steel, are available. Carboline Co., 7603 Forsyth Blvd., St. Louis 5, Mo.

Compound Water Meter

Servicing of water meters can be handled without shutdowns, it is claimed, by a manifold meter assembly, consisting of two Pittsburgh-Empire single register compound meters in combination with four Nordstrom lubricated plug valves and two 8-in. reducing manifolds. For maintenance, one side may be shut down at a time without complete interruption of service. Flow continues through the other meter passage. It is also possible to check-test a meter in place without a break in service. To make such a test, the discharge valve of the meter may be shut off and the test plug in the meter body used for the test run.

The assembly has a flow capacity of 1600 gpm, the American Water Works Assn. requirement for an 8-in. compound meter. The complete manifold of meters, valves and piping weighs 100 lb. less than a comparable 8-in. compound meter. Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.



Magnetic Separators

The Eriez Mfg. Co. announces that "ATOMagnets" are being installed in all its gravity flow hump assemblies. The standard magnetic hump, when installed vertically, removes tramp iron from heavy loose-flowing materials conveyed in down spouts. In the new assembly strategically placed baffles in the hump direct material flow 30 degrees from the normal straight line so that non-electric "ATOMagnets" installed on opposite faces of the hump can set up a magnetic barrier in tandem.

"ATOMagnets" incorporate several new features: fully riveted construction for increased rigidity; continuous hinge of non-magnetic aluminum for ease of cleaning and for longer service; formed aluminum cover to prevent accumulation of iron on backs of castings with consequent loss of magnetic strength. Eriez Mfg. Co., Erie, Pa.

Mechanical Seal

The Type 9 Mechanical Shaft Seal is designed to perform under severe temperature and corrosive conditions. A Teflon "wedge-ring" enables this seal to combine the chemically inert properties of Teflon with the flexibility and positive sealing components essential to mechanical sealing.

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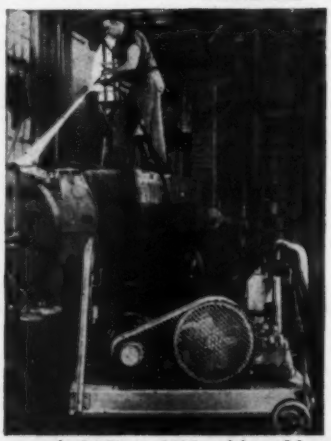

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They are exactly the same kind of wells and pumps Layne installs for cities, factories, railroads and other big users of well water. They have the same unmatched features of high efficiency, dependability and extra long life. No other make is so widely used or so thoroughly proven. No other is so low in upkeep.

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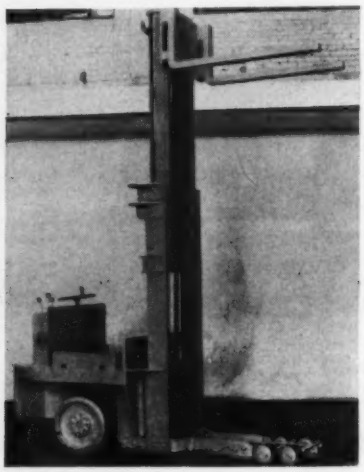


Electric Truck

To combine low truck weight with relatively high load capacity, a new basic truck employs a platform truck principle, with the load supporting member attached to the elevating mechanism; but in place of a platform, two reinforced alloy steel arms or forks are used. The forward wheels are only 6½ in. diam. and the arms in lowered position come outside and nearly flush with the top of the wheels. This arrangement provides for low underclearance in various type skids, as compared with 12 in. generally required for standard platform trucks.

Actual weight of a 6000-lb. capacity truck of the new type is two tons less than that of the ordinary 6000-lb. capacity fork truck. The trucks are bulit in several sizes with load capacities ranging from 4000 to 10,000 lb. Elwell-Parker Electric Co., Cleveland, Ohio.

Aluminum Scaffolds

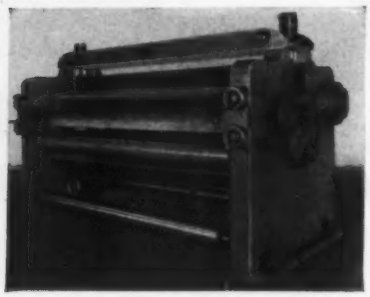
A variety of scaffolding units is available in aluminum, providing great mobility and savings in erection and dismantling time. Normally, one man can erect or take down an aluminum rolling scaffold, since the individual frames are light and easily handled.

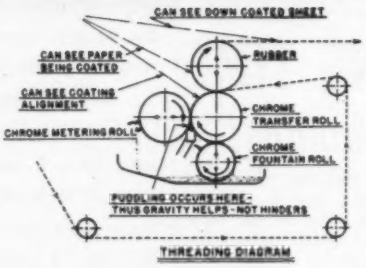
Two major types are offered—sectional rolling and sectional ladder scaffolds. The first type has base dimensions of 4 ft. 6 in. by 6 ft. and can be erected in heights of 40 in. to 7 ft. 4 in. Component parts lie flat for storage or transportation. Ladder scaffolds come in basic units 4 ft. 1 in., 5 ft. 8 in., or 6 ft. 1 in. high. They are 24 in. wide and can be combined with diagonal and horizontal braces and guard rails, all of aluminum. They will clear obstructions up to 5 ft. 10 in. high by 9 in. wide and roll easily through 30 in. doorways. The Patent Scaffolding Co., Inc., Long Island City, N.Y.

Coating Machine

The Contracoater is designed to apply lacquer, resin, plastisols, and organisols of a wide range of viscosities and formulation to paper, foil, film or fabric. Unusual control of coating weights is said to be obtained by a new design principle.

Unlike most reverse roll coaters that contain a well of coating material in the top nip of two rolls, the Contracoater uses a fountain roll. The coating material is picked up by the fountain roll and transferred to a center applicator roll. Metering to precise thickness is accomplished by a metering roll prior to the time the coating is applied to the web. The arrangement of edge doctors and dams under the applicator and metering rolls utilizes gravity to confine coating to any desired width. Thus creepage of coating beyond the dams is eliminated, creating a dry edge where necessary and preventing offset of coating material onto the backing roll.




CAN SEE DOWN COATED SHEET
CAN SEE PAPER BEING COATED
RUBBER
CAN SEE COATING ALIGNMENT
CHROME TRANSFER ROLL
CHROME METERING ROLL
CHROME FOUNTAIN ROLL
PUDDLING OCCURS HERE - THUS GRAVITY HELPS - NOT HINDERS
THREADING DIAGRAM

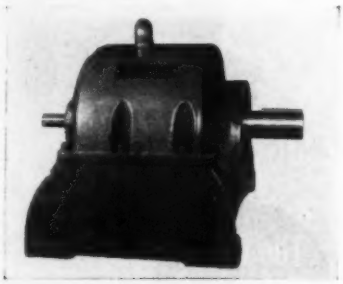
When the coating is satisfactorily distributed on the rolls, air controls bring the web into contact with the applicator roll, and a synchronous drive brings the operation up to speed. Thus there is no loss of web or coating material in making ready. Two other basic advantages of this roll arrangement are the exclusion of trapped air that causes bubbles on the coated surface, and the elimination of the flow factor of the coating materials themselves that affect control of thickness in conventional reverse roll coaters.

Threading variations and auxiliary equipment allow for knife coating, direct roll coating and dip coating. In standard widths up to 80 in. Dilts Machine Works, Fulton, N. Y.

Flow Signal Instrument

The High Pressure Flow Signal Transmitter is a pneumatically operated flow differential measuring unit which transmits proportional signals to remote recording or indicating instruments or to automatic control units. It is used for measuring flow differentials of liquid, gases or vapors, or for measuring static pressure or liquid level. Interchangeable measuring elements cover a continuous range of pressure differential from 5.5 in. water column to 100 psi, at static pressures up to 1500 psig. The Transmitter is being applied successfully to virtually every condition of operation in process industries and in steam power plants.

It consists essentially of an input differential pressure measuring unit, force balanced by an output system. The balancing force originates in a modulated loading air pressure resulting from the action on an escapement type pilot valve following any unbalance of linkage forces. Accuracy of measurement is within one per cent of full scale reading. Hagan Corp., Hagan Bldg., Pittsburgh 22, Pa.



Speed Reducers

The new type DB double-reduction speed reducers are designed for applications on small- to medium-size drives where the prime mover is coupled or belted to the gear unit. They use all-external type helical gearing, arranged in a horizontal plane. When coupled to an electric motor, a straight-line drive results. The units are manufactured in accordance with recommended practices of the A.G.M.A. Ratings are 1 to 100 hp.

Eight unit sizes are available; twelve standard gear ratios range from 6.25 to 58.3:1. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

Defoamer

A new liquid defoamer, named De-airex 506, is used as a dilute emulsion to provide economical foam control. It is a clear, amber-colored oil which is immediately soluble in either hot or cold water.

In addition to its foam controlling ability, it offers such advantages as ease of handling and mixing; stability of solutions, which can stand for several days; non-separating quality, regardless of the type of water used; and resistance to damage from freezing. E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Pipe Markers

A large line of adhesive markers for all types of conduits and pipes is offered for use where quick identification of the materials carried in the pipes is essential. They are recommended by the manufacturer not only for routine repair purposes but also in case of air attack, sabotage and other emergencies. Self-sticking, the markers are easy and quick to apply and are printed in bold letters on standard ASA background colors. Arrows show the direction of flow.

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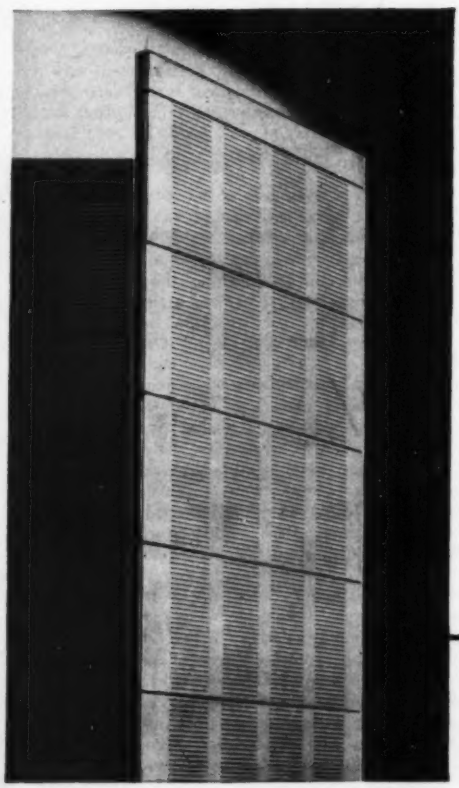

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30,000 FABRICATED SCREEN PLATES

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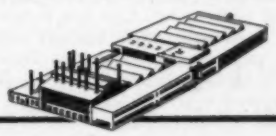
1. **Increased Plate Capacity**—The thin sheet eliminates relief milling, and with recommended arrangement, substantially increases capacity per plate.

2. **Longer Life**—Slots remain sharp, side walls highly polished for the life of the plate. There's greatly improved corrosion resistance.

3. **High, Sustained Yield**—You get consistent, uniform quantities of cleaner pulp.

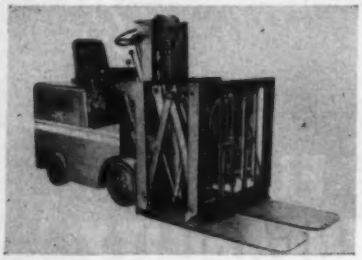
It all adds up to improved performance at reduced operating costs. Complete information is yours on request. Or if you like, we'll gladly have an engineer call.



MAGNUS METAL CORPORATION, *Fitchburg, Massachusetts*
Metalworkers for the Paper Trade

SCREEN PLATES: BRONZE, CHROME-NICKEL-STEEL, AND INCONEL
VALVES: GATE, SWING CHECK, BLOW, GLOBE, ANGLE AND "Y"

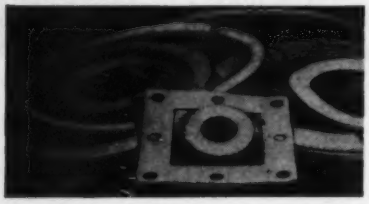
materials listed in American Standards Association Std. A13, are carried in stock. In addition, markers are carried for all materials listed in Technical Association of the Pulp and Paper Industry Std. No. 1 p-46. Special markers can be made to order. The line is called "Quik-Label" Pipe Markers. W. H. Brady Co., 1602 E. Spring St., Chippewa Falls, Wis.



Fork Truck Devices

The Pul-Pac and Pusher, for loading and unloading Clark fork trucks, are now available for the 2000 lb. capacity trucks. Formerly they were available only for larger sizes.

The Pul-Pac pulls and pushes unit loads, assembled on carrier sheets rather than on conventional pallets, on the load-carrying plates. The Pusher is used for unloading operations only. Unit loads can be unloaded directly from the forks or from conventional pallets whenever rehandling as a unit is not required. Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.



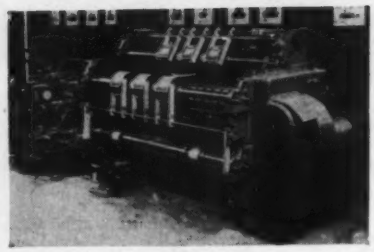
Asbestos Gaskets

PARS asbestos gaskets are designed for rough service where surfaces are uneven and subject to considerable expansion and contraction. For manholes or handholes, they can be used to hold steam, air, water, ammonia and various other acid and alkali chemicals in storage tanks, cookers, dryers, locomotives, tank cars and boilers.

On standard sizes, flanges are 3/16 in. thick and 7/16 in. wide or larger. Inside diameters are from 2½ to 18 in. Special gaskets of larger sizes and square or oval shapes are made to order. Lawton H. Parsons, 6 S. Main St., Ambler, Pa.

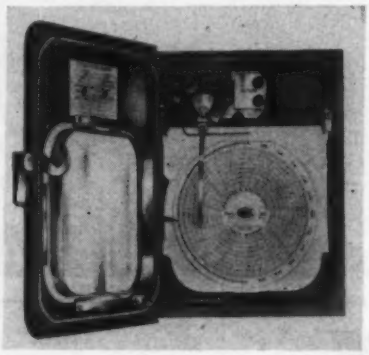
High Pressure Valves

The R-P&C Forged Steel Gate valve was designed for the high pressure field. A small, general purpose valve, it has features to insure maximum service life and tightness under varying service conditions. Extremely hard wedge facing minimizes seizing, galling and abrasive wear. Stainless steel gland bolts and nuts prevent freezing or corrosion, while the two-piece gland and follower applies uniform pressure on packing and will not bind on stem. Available in sizes of ¼, ⅜, ½, ¾, 1, 1¼, 1½ and 2 in. R-P&C Valve Div., American Chain & Cable Co., Reading, Pa.



Acetate Rewinder

Originally built for Celanese Corp. of America, the Camachine Triplex is a slitting and rewinding machine used for converting acetate film. It is designed for speeds up to 800 fpm and has a rewind capacity of 15 in. diam. The machine is equipped with a variable speed hydraulic main drive and a separate but positively interlocked variable speed rewind shaft drive. The rewind shaft speed varies inversely with the diameter of the dewound rolls, avoiding overheating of the cores and consequent damage to the inner laps of the rewound rolls. Cameron Machine Co., 61 Poplar St., Brooklyn 2, N.Y.



Electric Recorders

The Series 500 voltmeters and ammeters make a continuous record of voltage or current on an 8-in. circular chart. They feature an entirely new measuring mechanism, consisting of a moving iron that produces a high actuating torque at a low electrical burden. The mechanism has shock-protected precision stainless steel bearings, magnetic damping, and a locking device to prevent damage due to rough handling. Both ammeters and voltmeters are furnished in a variety of models for wall, surface-panel or flush-panel mounting, and for open terminal or conduit connection, as well as portable and pole mounting models. The Bristol Co., Waterbury 20, Conn.

Small Air Cylinder

A one-inch stroke small air cylinder has been developed, primarily for use in jig and fixture operations and for parts positioning and ejection. The trade name of the new device is the Han-D-Air Cylinder. It has a power factor of 1:1.

Compact in design, the cylinder is only 4½ in. long, 1½ in. high and 1½ in wide, and can be mounted in practically any position. It has a 5/16 in. diam. piston rod and a 1⅛ in. bore. Construction is of sturdy, heavy gauge pump finish brass and ⅝ in. thick aluminum alloy. The Bellows Co., Attn.: W. C. Richards, Jr., 222 W. Market St., Akron 9, Ohio.

New Product Briefs . . .

▶ CORRISION COMPUTER—The Harper computer is a printed, pocket-sized paperboard device that quickly tells the proper nonferrous or stainless steel alloys to use for 142 corrosive situations. H. M. Harper Co., 8200 Lehigh Ave., Morton Grove, Ill.

▶ LIGHT TRUCKS—The "Lift King" light capacity trucks are completely redesigned to allow sit-down operation as well as short wheelbase and maneuverability. Capacities are up to 2000 lbs. Automotive-type controls are featured. Yale & Towne Mfg. Co., Philadelphia Div., 11,000 Roosevelt Blvd., Philadelphia 15, Pa.

▶ AUTOMATIC TAPE DISPENSER—With the Dial-Taper, the operator simply selects on a dial the length of gummed tape needed, automatically starting and stopping the machine as it dispenses the desired amount. Electrically operated. Marsh Stencil Machine Co., Belleville, Ill.

▶ BRONZE SOLENOID VALVE—A corrosion resistant solenoid operated shut-off valve is designed for instant control of all types of fluid pressure operated equipment. Made of cast naval bronze, the model is called the LDS-2-750. In pipe sizes ¼ through 2 in. Airmatic Valve, Inc., 1643 E. 40th St., Cleveland, Ohio.

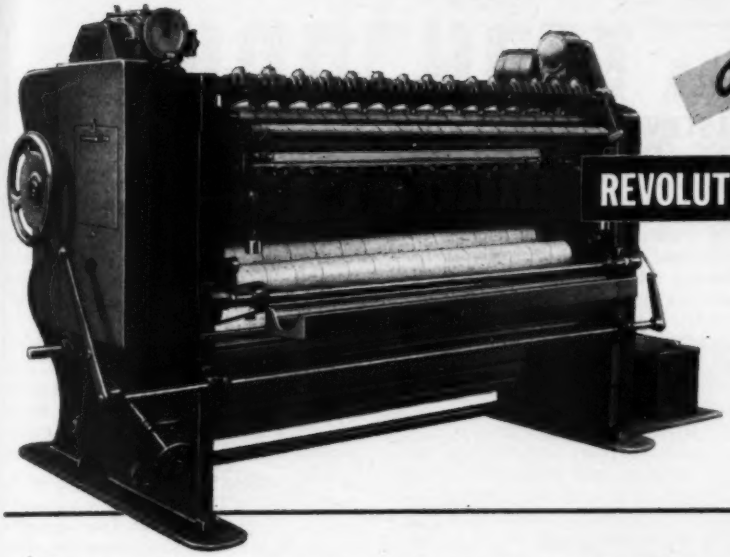
▶ AIR POLLUTION INDICATOR—An instrument for analyzing the direction of dirt fall has been developed by Battelle Institute. Several "directional dirt-fall collectors" used in correlation with weather bureau reports will give a complete index of the sources of air contamination. Eberbach & Son Co., Ann Arbor, Mich.

▶ TANK HEATERS—Low density electric heat for open tanks and pressure vessels is provided by a line of tubular heaters. Overheating is said to be eliminated, and the manufacturer recommends the heater for use in oils, tars, resins and other viscous fluids. Hynes Div., Martin-Quaid Co., 1875 Sedgley Ave., Philadelphia 32, Pa.

▶ PHOSPHATE RUST-PROOFING — Perm-Cote is a metal bath that provides a non-metallic phosphate coating which is then impregnated with a dry oil known as Perm-Oil. The result is a low-cost rust-proofing process that is said to replace cadmium or zinc in finishing coats on iron or steel. Detrex Corp., Box 501, Detroit 32, Mich.

▶ RUSTBOND PRIMER—A new type of primer is said to lock paint film to surfaces that have rusted, reducing splitting of top finishes to nearly zero. Particularly effective with vinyl paints, but compatible with many types in tests. Rustbond Primer is believed to partially reduce rust to iron. Carboline Co., 7603 Forsyth Blvd., St. Louis, 5, Mo.

▶ REMOTE CONTROL—A hydraulic remote control system known as the Superdraulic is completely self-contained, requiring no external power source. Consisting of two separate units, the action of the master unit is accurately reproduced by the remote or "slave" unit. Engineering is available for special applications. Superdraulic Corp., 14256 Wyoming Ave., Detroit 4, Mich.



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The Paper Industry New Literature

PRACTICAL PAPER TECHNOLOGY. By William Bond Wheelwright. Published by M. J. and W. B. Wheelwright, Cambridge, Mass. 101 pages. 9 x 6. Paperbound, $2.25 to U.S. or Canada, $2.50 to foreign countries. Clothbound library edition, $3.00.

Mr. Wheelwright, known for such earlier works as *Printing Papers, Paper Trade Terms* and *From Paper Mill to Pressroom,* in this volume places emphasis upon paper properties and their relations to the requirements to be met in conversion and use, particularly in the graphic arts. This is not a technical text, but rather one planned to suggest to those in trades allied to paper the methods whereby they may acquire a working knowledge of the properties and uses of paper.

Twelve chapters comprise the book. Chapter 1, "Progress in the Paper Industry," gives a concise and informal history of papermaking methods and techniques; the several pulp making processes used today are explained non-technically and their influence upon paper properties is described.

Chapter 2, titled "How to Judge Paper," lists the factors which result in good paper quality, and suggests that the paper buyer observe visually any paper considered for purchase, judge its finish by standards described by Mr. Wheelwright, develop the ability to feel its weight; and judge its formation, brightness, and finish by visual observation. Chapter 3 continues to describe the physical aspects of paper; Chapter 4 presents a series of practical manual and visual tests whereby the paper buyer can decide upon the suitability of a specific paper for a specific use.

Chapter 5 tells essential facts about papermaking; Chapter 6 discusses fabrication of coated, glazed and specialty papers. Chapters 7, 8 and 9 consider the permanence of paper, paper as a medium for printing, and difficulties in converting.

The concluding chapters, 10, 11, and 12, discuss the three chief printing processes—letterpress, offset, and intaglio.

The volume closes with a bibliography suggested to the non-technical reader for his study or reference.

THE 1951 EDITION PAPER YEAR BOOK. Edited by Anita Reinig. Published by Davidson Publishing Co., 405 East Superior St., Duluth 2, Minn. 8½ x 11⅛. 625 pages. Leatherette bound. $10.00.

The ninth annual edition of the Yearbook has been revised to include all changes in paper products usage since last year's edition was published. Many new products, new charts and new tables suggest innovations in the use of paper in the past year; furthermore, this edition has been enlarged to include some 40 pages more of material than did last year's version.

Nine major sections, thumb-indexed for easy reference, present a total of over 700 photos and 100 tables and charts. Like its predecessors, the Yearbook gives papermaking information that is perhaps too basic to be of interest to the experienced papermaker, but is likely to be of value to the paper jobber or salesman.

Miscellaneous facts of interest to such readers include data on fine and printing paper, paper markets, manufacturers' addresses, standard sheet sizes and stock requirements for printed pieces, practical testing methods and paper making, and on non-paper products commonly marketed through paper merchants.

OPD RECORD OF PRICES (1951) ON CHEMICALS AND RELATED MATERIALS, Volume 1A. Published by Schnell Publishing Co., Inc., 30 Church St., New York 7, N.Y. 9 x 12. Paperbound. 244 pages. $6.25.

Compiled from more than a million price quotations reported in the weekly issues of OIL, PAINT AND DRUG REPORTER in the past four years, this new volume is a factual record of price behavior. Papermakers will find records of all chemicals known in their work among the listings of agricultural chemicals; botanical drugs; coaltar chemicals; drugs; fine chemicals; essential oils and aromatics, heavy chemicals; oils, fats and waxes; and textile and leather chemists.

The book will be of particular interest to purchasing agents, sales departments, formulae chemists, and market researchers.

HANDBOOK OF THE NORTHERN WOOD INDUSTRIES, 1950. Compiled by T. L. Lyrholm. Published by A. B. Svensk Travaru-Tidning (The Swedish Timber and Wood Pulp Journal), Kungsgatan 17, Stockholm, Sweden. 1385 pages in addition to 82 pages of relevant advertising matter. 7½ x 5½. 7: de Uppl.

This, the 7th edition of the Handbook, is the first revision published since before the recent war; hereafter, the editors plan to bring out a new edition every three years.

Sections on forestry, timber, and woodpulp and paper are presented on each of the three nations included in the volume—Finland, Norway and Sweden. Lists on sawmills in these three countries are included according to principal lines of production and according to shipping districts.

Woodpulp and paper mills in the Northern countries, arranged according to their principal lines of production, form another section.

Advertisers have included material in both their own languages and English; the book's authors have, wherever possible, presented their material in English. Finger-tab guides to individual sections of the book simplify ascertaining the inclusion in this book of any particular information about Swedish, Finnish, or Norwegian papermakers. The book is, as well, more than adequately cross-indexed.

SOURCE OF SUPPLY DIRECTORY. Published by Howard Publishing Co., 111 W. Washington St., Chicago 2, Ill. Paperbound. 6½ x 4½. 798 pages. $4.00; $3.00 in quantities of five or more copies.

This, the twenty-fifth annual volume of the S O S, presents hundreds of new sources of value to the paper converter. Leading papermaking firms are included among the advertising pages; five valuable sections complete the book.

Section 1, Sources of supply for paper, classified supplies by products; section 2 lists paper converting machinery, equipment and supplies by subject rather than manufacturer.

Section 3 is a roster of paper merchants; section 4 lists manufacturer's representatives; and section 5 gives a similar listing of exporters and importers of paper.

Each of the five sections is presented in a separate color, for quick and easy reference.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Insulated Cables. United States Rubber Co., Rockefeller Center, New York 20, N.Y.—A catalogue on insulated telephone cables gives specifications and engineering characteristics, such as capacity and power factors, aging, tensile strength, etc. A new cable splice housing is featured.

Boiler Systems. Northern Equipment Div., Continental Foundry & Machine Co., Erie 2, Pa.—Bulletin 480 describes three different types of boiler feed control systems in three plants of Georgia Power Co. The report covers a three-influence control system with hydraulic couplings of the boiler feed pumps, a three-influence control using a feed control valve, and a two-element air-operated control.

Vinylite Resins. Bakelite Co., Div. of Union Carbide and Carbon Corp., 122 E. 42nd St., New York 17, N.Y.—"Vinylite Vinyl Acetate Resins" is a 28-page booklet to be used as a technical reference on the properties, advantages and limitations of these resins. Tables and text give essential data on the many types of this product.

Water Heaters. Pick Mfg. Co., West Bend, Wis.—A 4-page bulletin emphasizes savings effected by the Pick instantaneous steam injection heater in water heating systems. Seven standard sizes are described and specifications given.

Magnetic Trap. Tri-Clover Machine Co., Kenosha, Wis.—Catalogue Sheet 1151 describes the all-sanitary magnetic trap, made of stainless steel, to protect liquids from

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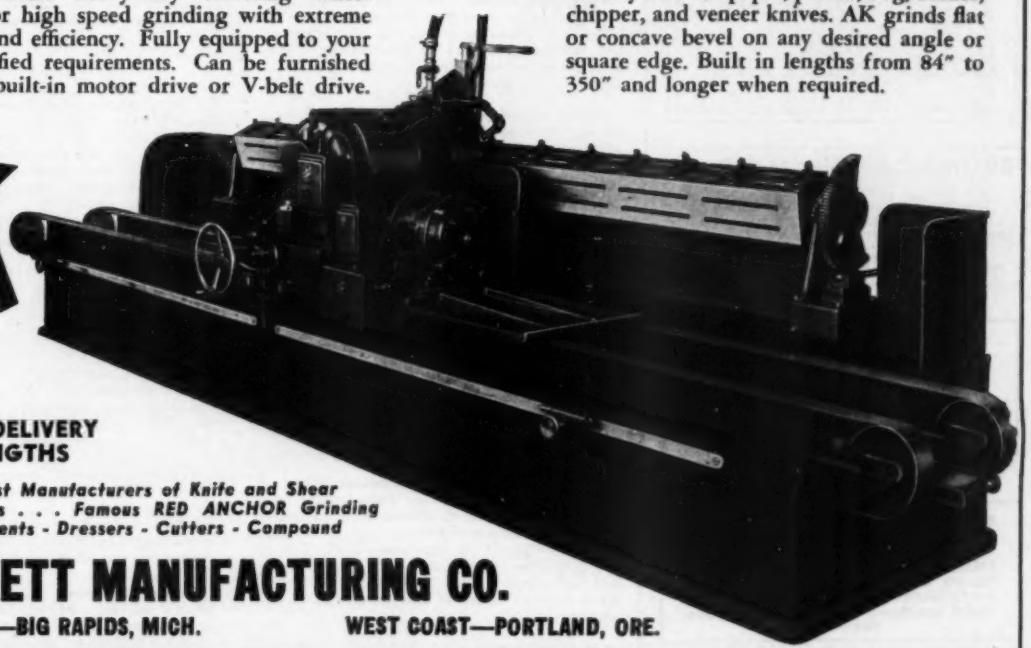

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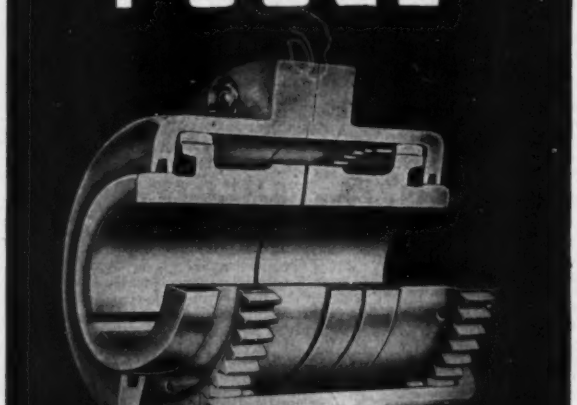

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Reports and Designs for Construction or Modernization of Pulp & Paper Mills, Steam and Hydro Power, Stream Pollution Abatement.

tramp iron and other stray metal particles. Ease of cleaning and construction features are covered.

Special Handling. Towmotor Corp., Cleveland 10, Ohio—A 4-page "Special Engineering" folder illustrates devices designed for difficult materials handling. Each item was designed to meet a specialized handling problem; none is standard.

Stainless Steels. Armco Steel Corp., Middletown, Ohio—Two new grades of stainless steel, Armco 17-4 PH and 17-7 PH, are covered in a 16-page booklet, "Armco Precipitation Hardening Stainless Steels." Properties such as high corrosion resistance, strength, and hardening characteristics are described.

Mixers. Chain Belt Co., Dept. PR, 1600 W. Bruce St., Milwaukee 4, Wis.—The improved line of Rex Hi-Discharge Moto Mixers is described in detail in this bulletin. Newly designed features are emphasized, including a chain drum drive system, new alloys and new spouting equipment.

Coating Equipment. Industrial Ovens, Inc., 13825 Triskett Rd., Cleveland 11, Ohio—"Continuous Automatic Processing Equipment" is a 16-page booklet presenting advanced machine design for coating equipment used in paper and textile webs and strand materials such as wire and cable. Individual elements of the processes are discussed in detail.

Film Library. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.—Catalogue B-4761 lists and describes 72 sound films available as free loans to groups. Subjects include general interest, production information, and training courses.

Furan Coating. Carboline Co., 7603 Forsyth Blvd., St. Louis 5, Mo.—Bulletin C-32, 4 pages, explains composition and use of "B" Resin, a flexible furan coating for corrosive service. Data Sheet C-33, 4 pages, summarizes 150 corrosion tests on "B" Resin.

Piping Manual. Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.—A new edition, 36 pages, of the "Piping Pointers" manual covers the fundamentals of sound piping practices in non-technical language. How-to-do-it features predominate. A separate 8-page "Valve Selection Guide" accompanies the manual. A 30-minute film based on the information in the manual is also available.

Adhesive Resins. Hercules Powder Co., Wilmington, Del.—"Hercules Resins for Adhesives," 18 pages, points out the range of uses for resins in adhesive manufacture. Three adhesive types are covered: rubber, cellulosics and water soluble.

Clamshell Buckets. Blaw-Knox Co., Pittsburgh, Pa.—Bulletin No. 2373, 40 pages, presents well-organized, practical information on the maintenance of clamshell buckets. Included are discussions of how to reeve the bucket and how to avoid common abuses.

Weatherproof Enamel. U.S. Stoneware Co., Co., Akron 9, Ohio; Attn. Mr. G. F. Fine—Bulletin 239, 4 pages, describes outstanding advantages of Neolac 600, an enamel finish paint for use on wood, metal or concrete. Details of use are included.

Adhesive Manufacture. Hercules Powder Co., Wilmington, Del.—24-page booklet reports on the use of certain Hercules resins in the manufacture of adhesives. Their contributions to film cohesion, surface tack and bond strength of many types of adhesive are covered.

Materials Handling Equipment. Yale & Towne Manufacturing Co., Philadelphia Div., 11000 Roosevelt Blvd., Philadelphia 15, Pa.—A 44-page catalogue covers basic equipment and attachments in this company's line of materials handling equipment. Included are gas and electric fork lift trucks, motorized hand trucks, hand lift trucks, and hand and electric hoists.

Dust Precipitators. American Blower Corp., Dept. D-26, Detroit 32, Mich.—Bulletin 1728, 12 pages, covers the Series 342 dust precipitators made to handle fly ash, cinders and industrial dusts. Design features which enable field erection and special arrangements are illustrated and described.

Induction Motors. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.—Booklet B-4739, 28 pages, summarizes the types and uses of the large, polyphase induction motor. Applications are illustrated for a number of industries, including paper and power station.

Dust and Fume Control. American Wheelabrator & Equipment Corp., Michawaka, Ind. —*Industrial Ventilation* is a new periodical devoted to developments in industrial dust and fume control. First issue, April, 1951, contains illustrated case histories on the use of Dustube cloth-tube filters.

Flooring. Stonhard Co., 1306 Spring Garden St., Philadelphia 23, Pa.—A 4-page bulletin briefly describes Stonpach, a floor topping of extreme density. Its resistance to excessive chemical conditions is stressed. Other Stonhard building repair products are briefly mentioned.

Heavy-Duty Trucks. Baker Industrial Truck Div., Baker, Raulang Co., 1250 W. 80th St., Cleveland 2, Ohio—An 8-page specification bulletin, No. 1325, gives the major components of the FT-60 6000 lb. capacity fork truck. Sixteen different applications in eight industries are given.

Potato Starch. Morningstar, Nicol, Inc., 630 W. 51st St., New York 19, N.Y.—A 4-page booklet, packed with information, titled "Potato Starch in the Textile Industry." Characteristics, selection and use of potato starch are covered.

Chemical Engineering. R. S. Aries & Associates, 400 Madison Ave., New York 17, N.Y.—"Commercial Chemical Development" is a brief folder that answers five questions about production and selling of chemical products. The Aries firm of consultants is introduced and some of their work outlined in this publication.

Air Conditioning. Westinghouse Electric Corp., 306 Fourth Ave., Box 1017, Pittsburgh 30, Pa.—An 8-page leaflet, No. SA-6691, describes the Precipitron electronic air cleaner in non-technical language. Air cleaning units for factories, stores, offices and homes are covered. Booklet B-5160, "A Planning Guide for Industrial Air Conditioning," 20 pages, gives simple explanations of the functions and types of installation of air conditioning systems.

Valves. Jarecki Valve Div., H. K. Porter Co., Inc., Drawer 2650, Tulsa, Okla.—The New Jarecki Valve Price List, 8 pages, contains information on sizes, materials of construction and prices of the Jarecki line. Included are bronze and iron valves, cocks, and unions, and expansion and swing joints.

Pumps. Peerless Pump Div., Food Machinery Corp., 301 West Ave. 26, Los Angeles 31, Calif. —A 24-page bulletin, No. B-2300, gives comprehensive treatment to the company's horizontal Fluidyne pump line. Important features for general use are described in detail.

Transportation Gears. General Electric Co., Schenectady 5, N.Y.—An 8-page bulletin, No. GEA-1054B, describes a wide assortment of pinions and gears for railroad, urban transit and industrial haulage equipment. Pictured are G-E gear manufacturing and testing facilities.

Coating Compound. American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y.—Technical Bulletin No. 21-A describes Azite 900 Liquifier and its use in paper coatings and surface sizing. Results of research since the compound was first marketed are included.

Water Softeners. Cochrane Corp., Philadelphia 32, Pa.—Bulletin No. 4530, 16 pages, on Cochrane Hydrogen Zeolite (Cation Exchange) Softeners, describes the process and the zeolites and equipment used. Advantages of the system and its relation to the Sodium Zeolite Softening process are covered.

Viscosity Control. Fischer & Porter Co., 4030 County Line Rd., Hatboro, Pa.—A 12-page catalogue, No. 88, describes Viscorator instruments that provide an instantaneous method for determining viscosity values. New constant meter developments are featured, as well as basic information on viscosity measurement.

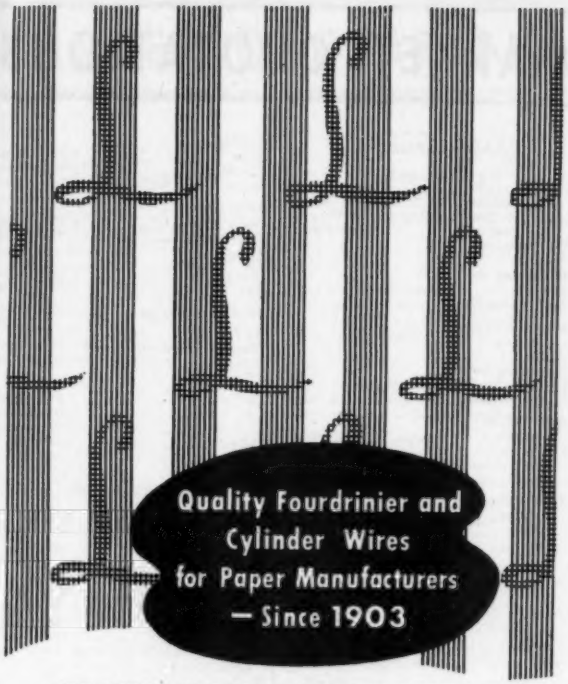
Plug Control. Shartle Bros. Machine Co., Middletown, Ohio—A 2-color 4-page bulletin (No. 12-SB) describes Duotrol, a new system of automatic plug control which is applicable to all makes, types and sizes of jordans and other conical refiners. Savings in power consumption and machine wear are stressed.

Field Frequency Controls. Electric Machinery Mfg. Co., Minneapolis, Minn.—This 8-page bulletin, No. 3100-PRD-204, illustrates and describes all the standard types of Polarized Field Frequency Synchronous Motor Controls for full-voltage, reduced-voltage and part-winding starting. Catalogue-type data includes ratings, weights, drawings and diagrams for each type of control.

Scales. Detecto Scales, Inc., 540 Park Ave., Brooklyn 5, N.Y.—"Saving Industrial Hours" is a 4-page leaflet on 14 models of scales for various uses, from postal scales to 300-lb. industrial scales.

Water Treatment. The Dorr Co., Barry Pl., Stamford, Conn.—A 32-page bulletin on the Dorreo Hydro-Treator describes this high-rate unit designed for softening, color or turbidity removal from water supplies. Operating data on this sludge-blanket method is given in detail.

Fork Trucks. Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio—"Towmotor-ize" is a broadside introducing various models of fork lift trucks. A new pallet truck is featured, and an enclosure offers further literature on job studies and the new model.



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MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are OPS ceiling prices, cents per pound, delivered mills:

	per cwt.
Blue Overalls	14.50
Corduroy	8.00
Washables, No. 1	6.50
Percales	12.50
Light Prints, No. 1	11.50
Khaki Cuttings—	
Sun Tan	11.50
Mixed	8.00
New White Canvas	19.00
Canton Flannels, bleached	21.00
Canton Flannels, unbleached	21.00
Shirt Cuttings—	
New White No. 1	21.00
Silesias No. 1	16.00
New Unbleached	21.00
Fancy	10.00
Linen Cuttings—	
American	14.50
White	31.00
Grey	21.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.	
Roofing—		
No. 1	2.10 to	2.20
No. 2	2.00 to	2.10
No. 3 and 4	1.80. to	2.00
Twos and Blues—		
Repacked	4.75 to	5.00
Thirds and Blues—		
Repacked	4.25 to	4.50
Miscellaneous	3.75 to	4.00
Whites, No. 1—		
Repacked	5.75 to	6.00
Miscellaneous	4.50 to	4.75
White, No. 2—		
Repacked	4.00 to	4.25
Miscellaneous	3.25 to	3.50

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.	
Gunny No. 1—		
Foreign	7.00 to	7.25
Domestic	7.00 to	7.25
Wool Tares—		
Light	9.50 to	10.00
Heavy	10.00 to	11.00
No. 1 Scrap Bagging	6.00 to	6.25
Manila Rope—		
No. 1 large	9.00 to	9.50
No. 1 small	8.00 to	8.50
Sisal Rope—		
No. 1 large	8.00 to	8.50
No. 1 small	7.50 to	8.00
New Burlap Cuttings	8.50 to	9.00
Jute Threads—		
Foreign (Nom.)	7.50 to	8.00
Domestic	7.50 to	8.00
Strings—		
No. 1 sisal	5.50 to	5.75
No. 2 sisal	5.00 to	5.25
Soft jute	5.25 to	5.50
Mixed	3.50 to	3.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	225.00—
Hard White, No. 1	190.00—
Soft White, No. 1	130.00—
Soft White, one-cut	150.00—
Soft White, Misc.	125.00—
Fly Leaf, No. 1	80.00—
Fly Leaf, Woody No. 1	60.00—
No. 2 Mixed Col. Woody	50.00—
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	55.00—
Mixed Books	33.00—
Ledger Stock—	
No. 1, White	115.00—
No. 1 Mixed (Colored)	85.00—
Manilas—	
New Env. Cuttings	130.00—
New Env. Cuts, One-Cut	—
Extra Manilas	85.00—
Manila Tab Cards, Free of Ground Wood	150.00—
Colored Tab Cards	110.00—
Kraft—	
New Envelope Cuttings	150.00—
Tripled Sorted No. 1 100%	100.00—
No. 1 Old Assorted	80.00—
News—	
White Blank	95.00—
Overissue	26.00—
No. 1 Folded	22.00—
Old Corrugated Container	48.00—
New Jute Corrugated Cuts	52.00—
Mill Wrappers	22.00—
Box Board Chips	20.00—
No. 1 Mixed Paper	20.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—		
Lump, cwt.	4.55—	
Ground, cwt.	4.30—	
Powdered, cwt.	4.70—	
Blanc Fixe—		
Pulp, bulk, ton	90.00—	
Dry, barrels	95.00—	
Bleaching Powder—		
Drums, cwt.	5.00 to	6.00
Casein (Domestic Standard)		
20-30 mesh (bags), lb.		
80-100 mesh (bags), lb.	45.00 to	45.50
Argentine, lb.	39.00 to	40.00
China Clay—		
Domestic Filler		
Bulk (mine) ton	10.00 to	15.00
Domestic Coating		
Bulk (mine) ton	15.00 to	25.00
Imported (ship side)		
Bulk (lump) ton	22.00 to	30.00
Chlorine—		
Tank cars (wks) cwt.	2.80 to	3.05
Gelatine (silicin), lb.	1.25 to	1.35
Glyc. (C.P.) drums, lb.	.50 to	.55
Litharge, powd. bbl. lb.	.18¾ to	.20

Rosin (Gum)—	New York, per 100 lbs.	
E	8.65—	
F	9.65—	
G	9.65—	
WW	9.75—	
Rosin (Wood), carlots,		
F.O.B. South	7.30—	

MARKET QUOTATIONS

Salt Cake—		
Dom. bulk (wks) ton	22.00 to	24.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	25.00—	
Soda Ash—		
Bulk (works) cwt.	1.20—	
Paper bags, cwt.	1.50—	
Soda (Caustic)—		
Solid drums, cwt.	3.35 to	3.40
Ground and flake, drums, cwt.	3.75 to	3.85
Sodium Silicate—		
60 deg. 55 gal. drums, (works) cwt.	1.80 to	1.90
40 deg. 55 gal. drums, (works), cwt.	1.50 to	1.60
Starch—		
Pearl, 140 lb. bags, cwt.	6.02—	
Pearl, barrels, cwt.	6.02—	
Paper (Sp.) bags, cwt.	6.02—	
Powdered, barrels, cwt.	6.25—	
Sulphur (Crude)		
(Mine) bulk, long ton	22.00—	
Talc—		
Dom. 100 lb. bags (mine) ton	25.00 to	28.00
Canadian	35.00 to	45.00
Titanium Dioxide—		
Barium Pig, bbls., lb.	.21 to	.21½
Calcium Pig, bbls., lb.	.21 to	.21½
Zinc Sulphide, bbls., lb.	11.50 to	11.75

WOOD PULP

The following are OPS ceiling prices on domestic wood pulp, dollars per short air dry ton delivered consuming mills including the basic maximum freight allowances as provided:

Bleached sulphite	140.00—
Unbleached sulphite	122.50—
Bleached sulphate	145.00—
Semi-bleached sulphate	140.00—
Unbleached sulphate	132.50
Bleached soda	140.00—
Ground wood	92.50—
Sulphite screenings	72.50—
Sulphate screenings	67.50—
Ground wood screenings	60.00—
Unbleached sulphate siderums	92.50—
Standard news print siderum	132.00—

OPS ceiling prices on European wood pulp, dollars per short air dry ton, on dock at American Atlantic ports, folow:

Bleached sulphite	225.00—
Bleached sulphate	230.00—
Unbleached sulphite	200.00—
Unbleached sulphate	200.00—

PAPER

f.o.b. New York City

Boards—	per ton
Binders	140.00—
Chip	105.00—
Chip, tube and can	115.00—
Chip, full blending	117.50—
Chip, sgl. mla. lined	130.00—
Coated, white patent	
.016	170.00 to 180.00
.020 and heavier	160.00 to 170.00
Kraft liner	115.00—
Filled News	107.50 to 110.00
Container	130.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	17.40—
B Grade E. F.	17.65—
A Grade S. C.	18.15—
B Grade S. C.	16.90—
No. 2 Uncoated Offset 4 sides, White	—
Machine Coated White	
No. 1 Glossy	23.40—
No. 2 Glossy	21.90—
No. 3 Glossy	20.40—
No. 4 Glossy	—
No. 2 Offset	17.40—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond— (In Ton Lots)	per cwt.
Extra 100% Rag	70.45—
100% Rag	62.45—
75% Rag	48.15—
50% Rag	38.90—
25% Rag	31.65—

Rag Content Ledger— (In Ton Lots)	per cwt.
Extra 100% Rag	72.65—
100% Rag	63.90—
75% Rag	49.40—
50% Rag	40.20—
25% Rag	33.00—

Sulphite Bond—	per cwt.
Air dry, watermarked	—
No. 1 watermarked	19.05—
No. 2 watermarked	18.10—
No. 4 watermarked	17.10—

Sulphite Ledger—	per cwt.
No. 1 watermarked	21.15—
No. 2 watermarked	21.00—
No. 4 watermarked	20.40—

Glassine (f.o.b. mill)—	per cwt.
Embossed (25 lb. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof—	
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—

News—	per ton
Rolls, Standard (Contract)	106.00 to 116.00
Rolls (Spot)	(Nominal)
Sheets	—

Tissues (Carlots)—	per ream
White No. 1	1.95—
White No. 2	1.85—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.85—
Manila	1.95—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	9.85—
Toilet, Unbleached (M shts.) per cs.	6.60—

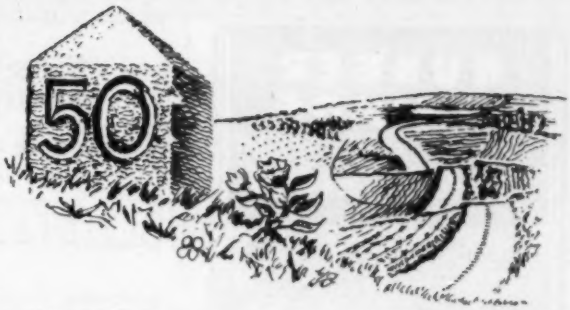
Towels	per case
Bleached	6.65—
Unbleached	5.65—

Wrappings (Kraft)—	per cwt.
Super-Standard	9.25 to 9.50
No. 1 Wrapping	8.25 to 8.50
Standard Wrapping	7.75 to 8.00
Standard Bag	7.50 to 7.75
Variety Bag	—

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)

Bleached Papers—	per cwt.
M.F. & M.G. Waxing, 20 lb. (carloads only)	—
(10,000 lb.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers	
Com. Gr. Butch. 40 lb.	
No. 1 Butchers	—
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—

Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	—
Env. Mla., Sub. 16-28 (No. 2)	—
Envp. Mla. (Prices based on large sheets untrimmed ream marked, in bdls.)	—
Wrapp. Mla. 35 lb. up—	
No. 1	8.75 to 10.25
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B-20 lb.	—
Grade A-22 lb.	—



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to resist
CORROSION

STOP! CORROSION and CONTAMINATION

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Broadway Rubber Corp.
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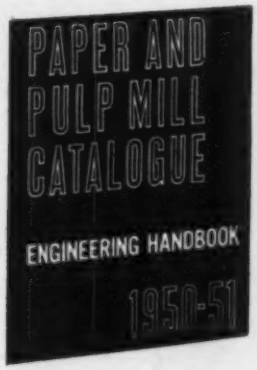

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Published by

Fritz Publications, Inc.

431 South Dearborn Street **Chicago 5, Illinois**

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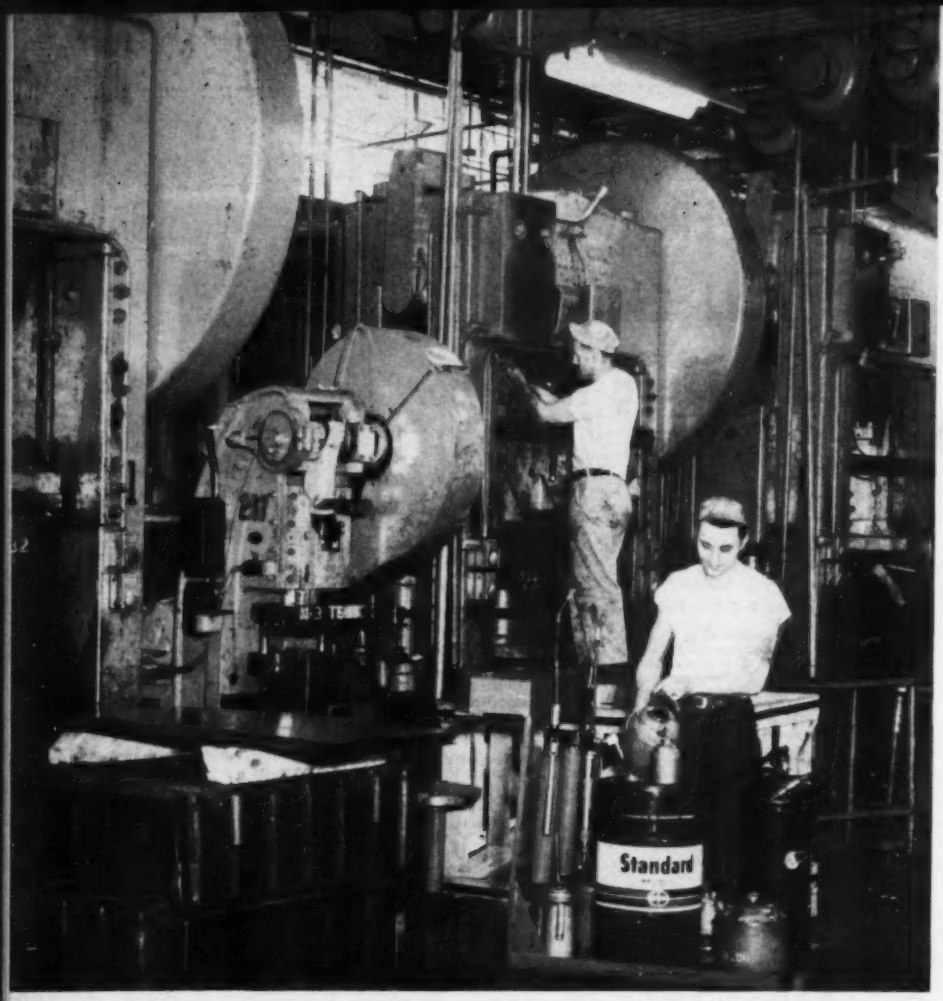

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SAVING

America's TREES

Manpower, too

A lot of men talk about conservation, but the engineers at the St. Joe Paper Company really did something about it. Back in March, 1950, they put the Sutherland High Yield Sulphate System into operation in their 400-ton-per-day pulp mill at Port St. Joe, Florida. At the end of the year, here's what they'd saved:

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Equal to 200,000 trees 10" in diameter

160,000 man-hours
for cutting and loading

These figures are based on a 20-percent increase in pulp yield, and cover less than a year's operation. During 1951, the engineers estimate that a 25-percent increase above normal yield will conserve 3,250 carloads of wood and a correspondingly greater number of man-hours.

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Get the *first* and *best* — Lunkenheimer's King Clip—constantly improved for nearly 60 years. Ask your distributor for more information.

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FIG. 1640

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